JUL 8 1885
410-Q.

—MONTHLY NUMBER.—

THE AMERICAN ARCHITECT AND BUILDING NEWS

A WEEKLY JOURNAL OF CONSTRUCTIVE AND DECORATIVE ART.

VOL. XVIII.—No. 497.] SATURDAY, JULY 4, 1885. PRICE, 15 CENTS.

BARTLETT, HAYWARD & CO.
(Established, 1836.)
ARCHITECTURAL IRON-WORK,
HOT-WATER HEATING.
Plans and Specifications and the Superintendence of the Heating and Ventilation of Public Buildings a specialty.
BALTIMORE, MD.

W. & J. SLOANE,
ARTISTIC CARPETINGS,
—AND—
UPHOLSTRY GOODS,
ANCIENT AND MODERN ORIENTAL RUGS.
BROADWAY, EIGHTEENTH AND NINETEENTH STS.
NEW YORK.

OXLEY, GIDDINGS & ENOS,
Designers and Manufacturers of
GAS-FIXTURES,
ART METAL-WORK,
CLOCKS AND BRONZES,
Special designs and estimates furnished upon application.
Architects' patronage most respectfully solicited.
224-230 CANAL STREET, 120-126 WALKER STREET, } NEW YORK.

JAMES P. WOOD & CO.
JAMES P. WOOD. JOSEPH WOOD.
STEAM-HEATING, VENTILATING, AND COOKING APPARATUS, ETC.
39 SOUTH FOURTH STREET, PHILADELPHIA, PA.

MITCHELL, VANCE & CO.
Designers and Manufacturers of
GAS FIXTURES,
ORNAMENTAL METAL WORK, CLOCKS AND BRONZES.
ARCHITECTS' ORDERS SOLICITED.
Special designs submitted on application.
WAREROOMS, 836 and 838 BROADWAY, MANUFACTORY, 24th and 25th STS. and 10th AVENUE, NEW YORK.

T. ASPINWALL & SON,
TILES of all descriptions for Floors, Walls, Hearths, Fireplaces and Decoration generally.
MANTELS, GRATES, AND OPEN FIREPLACES.
BRASS FENDERS, ANDIRONS, ETC.
Sole Agents for, and only direct importers of MINTON'S and the CAMPBELL TILE CO.'S TILES.
75 & 77 W. 23d St., (Masonic Temple) NEW YORK.

J. W. TAYLOR, CHICAGO. 146 LA SALLE ST.
NEW ARCHITECTURAL PHOTOGRAPHIC SERIES.
Send for Circulars, and Club rates on American and Foreign Periodicals.

OHIO BUILDING STONE CO.
QUARRYMEN AND DEALERS IN
BUFF AND BLUE OHIO SANDSTONE.
OFFICES:
127 SUPERIOR STREET, CLEVELAND, O.
BRANCH OFFICES:
247 BROADWAY, NEW YORK, N. Y.
350 FIFTH AVENUE, CHICAGO, ILL.
49 FIFTH AVENUE, PITTSBURGH, PA.

Established 1871.
CHARLES R. YANDELL & CO.,
IMPORTERS AND MANUFACTURERS
CABINET FURNITURE.
DECORATIVE PAINTERS.
Specialities:
Illuminated Leathers, Hand Painted Wall-Papers, Cordova Chairs, Curtains and Textile Fabrics.
Modelled Fibrine, a new patented material for ceilings and walls.
No. 6 EAST EIGHTEENTH STREET, FIFTH AVENUE, NEW YORK.

WHITTIER MACHINE CO.
Manufacturers of Steam and Hydraulic
ELEVATORS,
STEAM ENGINES, BOILERS, AND MACHINERY.
1176 TREMONT ST., BOSTON.
NEW YORK OFFICE, 91 LIBERTY STREET.
CHAS. WHITTIER, *Pres't.* A. C. WHITTIER, *Treas.*

L. S. GRAVES & SON,
PASSENGER AND FREIGHT
ELEVATORS.
NOISELESS, SAFE AND DURABLE
CENTRE STREET, ROCHESTER, NEW YORK.
NEW YORK OFFICE, 46 COURTLAND STREET.

STOKES & PARRISH,
30th & CHESTNUT STS., PHILADELPHIA, PA.
Hydraulic and Steam-Power
ELEVATORS.
SAFETY, SPEED, AND ECONOMY.
All kinds of Hoisting Machinery a specialty.
NEW YORK OFFICE, - - 95 & 97 LIBERTY STREET.

OTIS
PASSENGER AND FREIGHT
ELEVATORS,
A SPECIALTY FOR A QUARTER OF A CENTURY.
For Hotels, Office-Buildings, Stores, Warehouses Factories. Mines, Blast-Furnaces, etc.
OTIS BROTHERS & CO.,
NEW YORK, BOSTON, AND PHILADELPHIA.

CRANE'S
ELEVATORS,
CHICAGO WORKS, 10 N. JEFFERSON STREET.
NEW YORK OFFICE, 40 & 42 Wall St.
BOSTON OFFICE, R'm 80 Mason Build.
PITTSBURGH, PA., 111 Water St,
CLEVELAND, OHIO. Blackstone Build.
ST. LOUIS, MO., 620 Chestnut St.
MINNEAPOLIS, MINN. Hennepin Block.

MOORE & WYMAN,
ELEVATOR
—AND—
MACHINE WORKS.
37 FOUNDRY STREET, BOSTON, MASS.

SPANISH TILES "NOLLA'S."
The best colors and hardness ever produced in Flooring Tiles. *Original Designs for every Work.*
FERNANDO MIRANDA, Sole Agent in U. S.
92 Liberty Street, New York, N. Y.

THE UNITED STATES ENCAUSTIC TILE CO., Indianapolis, Ind.
PLAIN, GEOMETRICAL & ENCAUSTIC TILES, FOR FLOORS
Public Buildings and Private Residences.
HIGH ART MAJOLICA TILES for Mantel Facings, Friezes, Furniture, etc.
GLAZED AND ENAMELLED TILES for Hearths, Stoves, Wainscoting, etc.
Designs and Estimates furnished upon application.
NEW YORK OFFICE: 228 WEST 23d STREET.

CONSERVATORIES,
GREEN-HOUSES,
GRAPERIES,
SKYLIGHTS,
Erected and Glazed on Rendle's Patent "Acme" System.
Gold and Silver medals have been awarded to the two Model Conservatories, each 16 x 20 feet, exhibited at the World's Exposition, New Orleans.
Estimates, Plans, Illustrated Catalogue, on application to
ARTHUR E. RENDLE,
RENDLE'S HORTICULTURAL AND SKYLIGHT WORKS,
22 BROADWAY, COR. WALL ST., NEW YORK.
The Horticultural Hall, New Orleans, was erected and glazed by me.

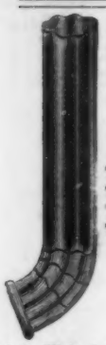
AMERICAN ENCAUSTIC TILE.
Acknowledged by experts to be
THE BEST IN THE WORLD.
Manufactured by the
AMERICAN ENCAUSTIC TILING CO. (Limited.)
OFFICE & SALESROOM, 116 WEST 23D ST., N. Y.
Designs and Estimates for Public Buildings, Halls, Churches, Vestibules, and for External Decoration, Bath-room, Stove, and Furniture Decorations.
GLAZED AND ENAMELLED TILES
FOR MANTELS, HEARTHS, WAINSCOTING, ETC.

SEYSSEL ROCK ASPHALT.
FOR SIDEWALKS, FLOORS, CELLARS, ROOFS, ETC.
BITUMEN DAMP COURSE.
DAMP RESISTING SOLUTION.
ACTINOLITE ROOFS,
29 Waverley Place, NEW YORK. } E. H. WOOTTON, N. Y. Mastic Works. { Arcade Bldg, R'ms 14, 16 & 17, CHICAGO.

MINTON'S TILES.
PLAIN AND ENCAUSTIC,
FOR PUBLIC BUILDINGS AND DWELLINGS,
As laid by us in
THE CAPITOLS AT WASHINGTON & ALBANY,
And in numerous Churches, Banks, and Dwellings in every part of the country.
Glazed and Enamelled Tiles for Mantels, Hearths, Wainscoting, etc., and for Exterior Decoration.
MILLER & COATES,
279 PEARL STREET, NEW YORK.

FLYNT
BUILDING AND CONSTRUCTION CO.,
GENERAL OFFICE, PALMER, MASS.
Contracts made for furnishing all material and labor necessary to build complete
MILLS, HOTELS, CHURCHES,
BUSINESS BLOCKS and RESIDENCES.
Also, for the construction of
RAILROADS, DAMS, AND BRIDGES.
We make Mill-Work a Specialty.
Can show some of the best Mill-Work in New England. Can give the best of references, and should be pleased to correspond with parties in any locality.

ROBERT C. FISHER,
Successor to FISHER & BIRD,
MARBLE AND GRANITE WORKS.
97, 99, 101 and 103 EAST HOUSTON STREET.
Established 1830. NEW YORK.



POPULAR BECAUSE RELIABLE.

AUSTIN'S PATENT

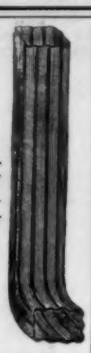
Expanding Conductor,

OR LEADER.

The ORIGINAL and only LEGITIMATE EXPANDING CONDUCTOR in the market, has been used for years and THOROUGHLY TESTED in all the PRINCIPAL CITIES and TOWNS in the UNITED STATES and is SPECIFIED by ARCHITECTS generally THROUGHOUT THE COUNTRY.

Austin, Obdyke & Co., Philadelphia,

SOLE MANUFACTURERS.



PRINCIPAL AGENTS.

S. D. Hicks & Son,	Boston.	B. G. Carpenter & Co.,	Wilkesbarre, Penn.
M. Halliday,	New York City.	The Miller Iron Co.,	Providence, R. I.
Bruce & Cook,	" "	Theodore Macknet & Co,	Newark, N. J.
Sidney Shepard & Co.,	Buffalo, N. Y.	Knisely & Miller,	Chicago.
Wasson & Co.,	Albany, N. Y.	J. C. McFarland,	Chicago, Ill.
Hoy & Co.,	Albany, N. Y.	Wm. Fuller & Co.	Baltimore, Md.
Reardon & Ennis,	Troy, N. Y.	The Blodgett & Clapp Co.	Hartford, Conn.
Troy Stamping Works,	Troy, N. Y.	Bakewell & Mullins,	Salem, Ohio.
Chas. Millar & Son,	Utica, N. Y.	Biersack & Neidermeyer,	Milwaukee, Wis.
W. H. Scott,	Portland, Me.	Jas. B. Scott & Co.,	Pittsburgh, Pa.
J. W. Jordan,	Worcester, Mass.	C. S. Mersick & Co.,	New Haven, Conn.
	Lewis Dauth, Reading, Pa.		

CARD.

By decisions of the U. S. Circuit Courts the *Exclusive Right* to manufacture *Expanding Conductors of any and all designs*, was secured to WILLIAM AUSTIN, and AUSTIN, OBDYKE & Co. are the only parties authorized to manufacture under Austin's Letters Patent, — all others will be considered and treated as

INFRINGERS.

THE ONLY REAL

EXPANDING CONDUCTOR.

— Guaranteed no Infringement. —

THE IRWIN & REBER

PATENT

EXPANDING WATER CONDUCTOR.

MANUFACTURED BY THE

S. S. S. Conductor Co.

LIMITED,

163 Lacock Street,

ALLEGHENY, PA.

THE STANDING SEAM allows of an easy and secure fastening, keeping the pipe far enough from the wall to make any overflow from the eave pipe or head, run down the spout, and not the wall; and will open, in case of freezing, so as to prevent bursting, and still remain double-locked and water-tight.

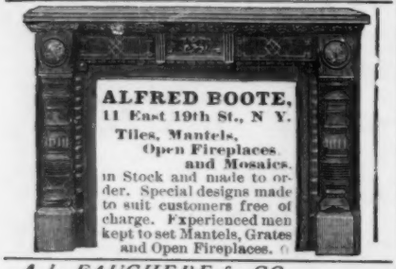
Made in 6-foot lengths, in a single sheet of

SOFT STEEL,

Either Galvanized, Kalameined or Leaded.

PRINCIPAL AGENTS.

E. B. Badger & Son, Boston, Mass.; Noyes & Wines, New York; J. S. Thorn, Philadelphia; John G. Hetsell, Baltimore; R. P. Gormully, Chicago; F. Schmitt & Sons, Milwaukee; Shackelton Bros., Cleveland; G. H. Peters & Son, Buffalo, N. Y.; James Ackroyd, Albany, N. Y.; Witt & Brown, Cincinnati; Hull & Cozzens Man'f'g Co., St. Louis. A. K. Sweet, Kansas City Mo., and many others



ALFRED BOOTE,

11 East 19th St., N. Y.

Tiles, Mantels, Open Fireplaces and Mosaics.

In Stock and made to order. Special designs made to suit customers free of charge. Experienced men kept to set Mantels, Grates and Open Fireplaces.

A. L. FAUCHERE & CO

Office and Warerooms,

433 AND 435 SEVENTH AVENUE, next to south-east corner Thirty-fourth Street,

Importers, Manufacturers, and Dealers in all kinds of

FOREIGN AND DOMESTIC

MARBLE FOR INTERIOR WORK

Estimates furnished on application.

MINTON, HOLLINS & CO

STOKE-UPON-TRENT

The original and existing Manufactory of

MINTON'S

Plain, Encaustic, Glazed, Enamelled, Majolica, Printed and Art-Painted Tiles, for Floors, Walls, Hearths, Mantels, Furniture, &c. Illustrated sheets of newest designs just issued.

SHARPLESS & WATTS, Agents,

No. 1335 MARKET STREET, PHILADELPHIA, PA.

A STANDARD

Speaking-Tube.

Architects and Builders, who wish to make sure of getting a thoroughly reliable article can secure it by specifying our new machine-made

LOCK-SEAM SPEAKING-TUBE.

LAMB & RITCHIE,

Boston Spiral Tube Works,

Cambridgeport, Mass.

Stained Glass.

W. J. McPHERSON,

PLAIN, DECORATIVE, DOMESTIC AND ECCLESIASTICAL

Stained & Leaded Glass Manufacturer.

440, 442 & 444 TREMONT STREET.

JAMES BAKER & SONS,

PROFESSIONALS IN

ART STAINED GLASS.

Established, London, Eng., 1854.

WORKS: 20 West 4th Street, New York.

The La Farge DECORATIVE ART CO.

33 East 17th Street, New York.

Contracts taken large or small for

MEMORIAL STAINED GLASS WINDOWS,

Stained Glass of Every Description,

Mosaic, Repoussée, Wood Carvings, Embroideries, and Hangings, for either

Ecclesiastical or Domestic Purposes,

and every kind of Interior Decoration for Public or Private Buildings.

Examples of Mr. La Farge's work may be seen at:— Trinity Church, Boston. St. Thomas's Church, N. Y. Memorial Hall, Harvard College. The Brick Church, N. Y. Garfield Memorial, at Williams College.

And the following private residences:— W. H. Vanderbilt, Cornelius Vanderbilt, N. Y. Cyrus W. Field. S. J. Tilden, N. Y. F. L. Ames, Boston.

Stained Glass.

REDDING, BAIRD & CO.,

SUCCESSORS TO COOK, REDDING & CO.,

Manufacturers of

STAINED GLASS

IN ALL ITS VARIETIES. IMPORTED

ROLLED CATHEDRAL GLASS

of our own importation furnished in any quantity and cut to size.

146 FRANKLIN ST., BOSTON, MASS.

SAMUEL WEST,

471 Tremont St., Boston,

Artist in Stained Glass

FOR ALL GRADES OF ORNAMENTATION.

Memorial Windows a specialty.

Awards of the highest merit for thirty years past.

METAL WORK IN BRASS, BRONZE, and STERLING SILVER.

J. & R. LAMB. 6th Ave. Cars pass the door.

59 CARMINE STREET, NEW YORK.

Send for Hand-Book, by mail.

New Designs in MOSAIC and JEWELED FIGURE-WORK. STAINED GLASS

McCULLY & MILES,

STAINED GLASS

1-3-5-7 & 9 MADISON STREET

Corner Michigan Avenue,

CHICAGO, - - ILL

ALFRED GODWIN & CO.

STAINED GLASS

For Churches, Dwellings, &c.

Send for illustrated Catalogue.

1201 Market Street, Philadelphia.

Donald MacDonald, Agt.,

Glass Stainer and Decorator.

Studio and Works, 400 Northampton St.

J. G. & J. F. LOW,
CHELSEA, MASS.
New York Retail Office, 9 E. 17th St.
REPRESENTED BY
Chicago, Henry Dibblee & Co., 266-268 Wabash Ave.
Albany, Richard Wickham.
Boston, C. A. Wellington & Co., 44 Boylston St.
Buffalo, Malcolm, Wolsley & Co.
Cincinnati, C. S. Rankin & Co., West Pearl St.

LOW'S ART TILES.

Cleveland, A. S. Herenden Furniture Co., Bank St.
Washington, Hayward & Hutchinson, Ninth St.
San Francisco, W. W. Montague & Co., Market St.
Minneapolis, Sullivan & Farnham, Third St., So.
Omaha, Milton Rogers & Sons, Farnam & 14th Sts.
Louisville, J. V. Escott & Sons, Fourth Ave.
St. Louis, Seidel & Schoenle, So. Fifth St.
Milwaukee, Mathews Bros.
Phila., W. H. Harrison & Brother, 1435 Chestnut St.
Pittsburgh, L. H. Smith & Co., 49 Sixth St.
Rochester, Hayden & Havens Co.
Syracuse, Hawley, Whitaker & Co., 83 S. Salina St.

Stained Glass.

Decorative Glass Manuf'g Co.,
218 WABASH AVE., CHICAGO.
Stained Glass by newly discovered processes at a fraction of former cost. Not an imitation. Send for Circular.

CLEVELAND
Stained Glass Works.
GEO. DRAKE, Proprietor,
99 and 101 Public Square, Cleveland, Ohio.

WILLIAM WRIGHT,
Interior Decorator,
STAINED GLASS.
Designer and Manufacturer of Fine Furniture, Rich Paper Hangings.
34 Fort Street, West, - - DETROIT, MICH.

Decorators.

Established A. D. 1848.
L HABERSTROH & SON,
Mural Decorators,
PAINTING IN ALL ITS BRANCHES.
28 School Street, Rooms 10 & 11, **Boston, Mass.**
20 Bellevue Ave., Near Kay St., NEWPORT, R. I.

J. PASQUALI & C. AESCHLIMANN,
Manufacturers of Roman and Venetian
Marble Mosaics,
For Floors, Walls, Ceilings, Mantels, Hearths, Decorations, etc. 231 East 28th St., Bet. 2d & 3d Aves. N. Y. Prices very moderate. *References:* Principal Architects and decorators of N. Y. *Note.*—A party advertising to have superintended all work of this nature in N. Y. has never superintended any work there.

H. EDGAR HARTWELL
28 West 23d St., N. Y. City.
ART DESIGNERS and MANUFACTURERS.
CHOICE FURNITURE.
UNIQUE FRESCOES.
MOSAIC GLASS.
INTERIOR WOOD-WORK

C. H. GEORGE & CO., Importers.
PAPER HANGINGS.
Exclusive Upholstery Goods and Decorations.
152 5th Avenue, New York.

FRANK HILL SMITH,
62 BOYLSTON STREET,
BOSTON..... .....MASS.

W. J. McPHERSON,
Established A. D., 1845.
Painter, Glazier, Designer, and Ecclesiastical
DECORATOR.
440, 442 and 444 Tremont Street.

RUTZLER & BLAKE,
HIGH AND LOW PRESSURE
Steam Heating Apparatus,
170 & 172 Centre St., New York.
E. RUTZLER, Established 1871. G. W. BLAKE, Established 1854.

ARTISTIC TILES
FOR WALLS, FIRE-PLACES AND FLOORS
OF PUBLIC BUILDINGS AND PRIVATE RESIDENCES. Manufactured by
The International Tile Co.,
(Limited.)
New York Office and Show Rooms:
8 East 17th Sreet.
Works, Third St., between Hoyt and Bond Sts.

AMERICAN AND SPANISH FLOOR
TILES
For Halls, Vestibules, Rooms and Churches,
GLAZED WALL TILES
For Bath-Rooms, Kitchens, etc.
J. K. BRIGHAM, 237 Broadway,
Corner Park Place, New York.

E. A. HITCHCOCK, President. GEORGE F. NEALE, Manager. C. W. BARNES, Treasurer.

CRYSTAL PLATE-GLASS CO.,

MANUFACTURERS OF

POLISHED PLATE-GLASS

SKYLIGHT-GLASS, FLOORING-GLASS,

ST. LOUIS, MO.

ESTIMATES PROMPTLY FURNISHED.

GILBERT S. KING, AGENT, 102 Chambers St., Room 40, NEW YORK.

LIQUID GLASS PAINT.

IT HAS STOOD THE TEST

Of holding Kerosene Oil in Paper Barrels, Boxes, and Bags. It will absolutely hold on Wood or Iron when in salt water, or exposed to salt air, longer than any paint ever made. For Private or Public Buildings it has no equal. Made in White and all Colors. ***Warranted not to crack or rub off. Send for Circular.***

Factory, Lyme, Conn.
Office, 147 Commerce St., Hartford, Conn. } THE LIQUID GLASS PAINT CO.

BARNES' PATENT FOOT-POWER MACHINERY.

Complete Outfits for Actual Workshop Business. Lathes for Wood or Metal. Circular Saws, Scroll Saws, Formers, Mortisers, Tenoners, etc.

CONTRACTORS AND BUILDERS.

We call the attention of contractors and builders to the fact that they can save themselves money and facilitate their business by using an outfit of Barnes' Hand and Foot Power Machinery. Every builder is aware of the advantage of being near a planing mill where he can have planing and sawing done at will. This is not always possible, and the builder is at great disadvantage when obliged to carry his work considerable distance, and be subjected to the usual delays, awaiting his turn, etc., besides the expense of handling and drawing the lumber to and from the mill. We have in this outfit no machine for planing lumber and can offer no relief in that line. We have, however, machines for ripping, cross-cutting, scroll-sawing, mortising and tenoning, forming edges, grooving, gaining, rabbeting, cutting dadoes and turning.

Builders use our Hand Circular Rip-Saw for the greater portion of their ripping in preference to carting their lumber to a mill within five minutes' drive from their shops. The same is true with regard to scroll-sawing, mortising, tenoning, cutting stuff for drawers, boxes, etc. These machines are not new and untried, but have been in use during the past ten years. They are strong, yet portable, enabling the builder to easily move them from his shop to the building he may have in process of construction.

Read the following letters from Builders:—

CLARENCE F. LEE, carpenter and builder, Morristown, N. J., says: "I have had one of your Hand Circular Rip-Saws for about three months, and am much pleased with it. Have done the ripping for 15 houses in that time, which is over forty miles through inch boards. Have ripped as high as 3-inch plank. Table is also good for rabbeting; have rabbeted all jambs and sawed all drips for 200 windows."

ALEX. SHIELDS, Lima, Ohio, Sept., 1882, says: "A few days since we had some 150 small drawers to make for drug store; the steam power mill wanted fifty cents each for making them. With my foot-power machinery I made them, and saved $25.00 above good wages on the job."

If desired, these machines will be sold **On Trial.** The purchaser can have ample time to test them in his own shop and on the work he wishes them to do. Descriptive Catalogue and Price-List free. Address,

W. F. & JOHN BARNES COMPANY, No. 428 Ruby Street, Rockford, Ill.

Annunciators, Electric.

EDWARDS & COMPANY,
(PATENT)
Electric Bells and Annunciators,
AUTOMATIC BURGLAR ALARMS, FIRE ALARMS, Etc.
Estimates for Electric Bells, Annunciators, Speaking-Tubes, Letter-Boxes, Door-Openers for Apartment-Houses, etc.
GAS-LIGHTING BY ELECTRICITY.
Factory: 4th Ave. and 144th St. Office: 171 Broadway, N. Y.

Inlaid Floors and Borders, Ceilings, Wainscotings, Mantels, Sideboards, Bookcases, Counters, etc.

W. E. WHEELER,
Successor to R. M. Hubbard & Co.
Established 1874
Manufacturer of Hubbard's Patent
Inlaid Floors and Border.
The most beautiful and durable floor made. Hundreds of them in the finest houses in the country. Illustrated Catalogue sent free. Fine dwelling, office, and hotel interiors and Art Furniture from special designs. Drawings and estimates furnished on application.
84 to 90 Erie Street, Toledo, Ohio.

Architectural Sheet-Metal Work.

G. L. Swett & Company,
Manuf'rs of Plain and Ornamental
SHEET-METAL WORK FOR BUILDINGS.
Copper Gutters, Cornices, Windows, Finials, Galvanized-Iron Ventilators, Roofing, etc.
IMPROVED METALLIC SKYLIGHTS.
N. B.—We warrant our Skylights to be Fire and Storm-Proof. They are the best made and are in use by the Heliotype Printing Co., Notman Photographic Co., U. S. Sub-Treasury and Post-Office, and nearly all the principal buildings in Boston.
295 Harrison Ave., cor. Motte St., Boston.

Iron Structures.

BOSTON BRIDGE WORKS,
D. E. ANDREWS, Engineer.
Office, ... 13 Pemberton Square Boston.
WROUGHT IRON TRUSSES,
BOX AND PLATE GIRDERS & BEAMS
For sustaining roofs, floors, walls, and other loads of all kinds, designed and built. Our long experience embraces the designing and construction of many wrought-iron structures, large and small, a conspicuous example of which may be examined in the wrought-iron trusses for roofs and floors of the Exhibition Building of the N. E. Manufacturers' and Mechanics' Institute, Boston.

Cement, Portland.

BROOKS, SHOOBRIDGE & CO.
Best English Portland Cement.
Works: Grays, Essex, England.
New York Office: No. 7 Bowling Green.
Also Roman Cements, Fire-Brick, Felt, etc.

Jail and House Iron-Work.

J. P. WALTON & CO.,
MANUFACTURERS OF
Jail and House Iron-Work,
Store-Fronts, Columns, Lintels, Sills, Joists, Anchors, Railings, Stairs, Bolts, Tree-Boxes, Balconies, Gratings, Crestings, Doors, Shutters, Bedsteads, and all kinds of Iron-Work used in the construction of buildings.
North-West Corner of Culvert and Harrison Sts.,
CINCINNATI, OHIO.

Decorative Glass by Sand Blast.

JOHN MATTHEWS,
First Avenue, Twenty-sixth and Twenty-seventh Streets,
NEW YORK.
Sole licensee in New York of the TILGHMAN SAND BLAST.
Decorative Glass from Late Designs Executed by Sand Blast or Embossing Process in a Superior Manner.
SHEET AND PLATE GLASS GROUND TO ORDER.
Send for Illustrated Catalogue or Estimates.

Portland and Keene's CEMENTS.

J. B. WHITE & BROS., (Limited.)
Manf's of English Portland and Keene's
Superfine and Coarse Cements.
We beg to announce that we have changed our Importer and have appointed MARCIAL & CO., 36 Broadway, N. Y. our sole agents for the Atlantic Seaboard of the U. S., and we ask all buyers of our Cements to address all inquiries to them.
LONDON, February 1st, 1885.
WHITE'S PORTLAND.
Quality and packages the best. Works the largest in the world. Price the lowest for the quality.

Fireplaces, Ash-Traps, and Grates.

EUREKA GRATE WORKS,
Manufacturers of
PATENT FIREPLACE LININGS,
Patent Self-closing Ash-Traps,
Grates of all kinds,
Iron Mantels, and Importers of Tiles.
CINCINNATI, OHIO.

Peerless Colors for Mortar.

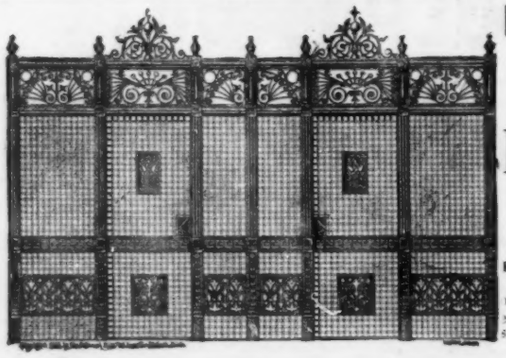
PEERLESS COLORS FOR MORTAR,
BLACK, BROWN, BUFF, RED.
Brightest and Most Durable Colors Manufactured.
SEND FOR CIRCULAR.
SAMUEL H. FRENCH & CO.,
York Avenue and Callowhill Street, Philadelphia, Pa.

Elevators and Hoisting Machinery.

STEPHEN A. MORSE. C. M. WILLIAMS. EDWIN F. MORSE
Morse, Williams & Co.
Manufacturers and Builders of
Hydraulic, Steam, Belt and Hand-Power Passenger and Freight Elevators, Dumb-Waiters, Automatic Hatch-Doors, etc.
Sole owners of the right to apply the Heebner Patent Governor to Elevators and Hoisting Machinery. *Send for Illustrated Circular*
Nos. 411 and 413 Cherry Street, Philadelphia, Pa.
Branch Office, 108 Liberty St., New York.

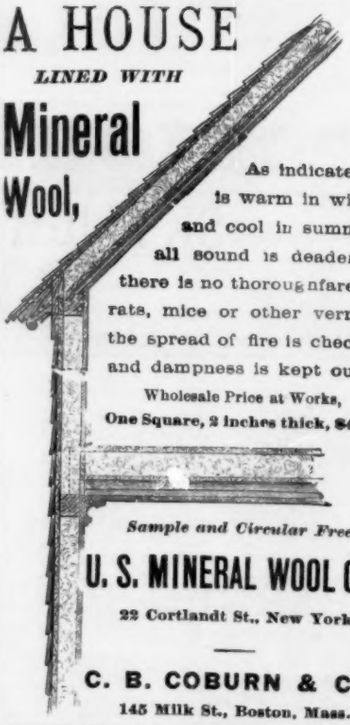
Steam Heating.

Page Steam Heater.
The Cheapest, Most Economical and Efficient Heater in the Market.
SPECIFICATIONS AND ESTIMATES FURNISHED.
Send for Circulars.
PAGE STEAM HEATING COMPANY,
NORWICH, CONN.



National Wire & Iron Co.,
DETROIT, MICH.
Manufacturers of
Iron, Wire and Brass
Elevator Enclosures.
We have recently furnished the new Board of Trade and Royal Insurance Buildings, of Chicago, Ill., with Iron and Brass Elevator enclosures, to which we point as a standing reference. Write for estimates and particulars.

A HOUSE
LINED WITH
Mineral Wool,



As indicated, is warm in winter and cool in summer; all sound is deadened; there is no thoroughfare for rats, mice or other vermin; the spread of fire is checked and dampness is kept out.
Wholesale Price at Works,
One Square, 2 inches thick, $4.00.
Sample and Circular Free.
U. S. MINERAL WOOL CO.,
22 Cortlandt St., New York.
C. B. COBURN & CO.,
145 Milk St., Boston, Mass.

BALL BEARING DOOR HANGERS
For House Doors, Car Doors, Elevator Doors.
Frictionless. Indestructible. Perfect. Send for Circular.
COHOES IRON FOUNDRY & MACHINE CO., COHOES, N. Y.

BURDITT & WILLIAMS,
20 Dock Square,
BOSTON.
Unequalled Stock of Choice Hardware.
Specifications figured and orders filled in all markets.

SETH THOMAS CLOCK CO.,
THOMASTON, CONN.
20 MURRAY ST., NEW YORK,
TOWER CLOCKS.
SEND FOR CATALOGUE.

McSHANE BELL FOUNDRY

Manufacture those celebrated Bells and Chimes for Churches, Tower Clocks, &c., &c. Prices and Catalogues sent free.
Address
H. McSHANE and CO.,
Baltimore, - - - Md.

Architects, Builders, and others will confer a favor on the Publishers by mentioning "The American Architect and Building News" when sending for circulars or corresponding with parties advertising in these columns.

Elevators.

Z. WILE,
PASSENGER AND FREIGHT ELEVATORS,
Hand-Hoists, etc., of the latest improved inventions now manufactured. Invalid Elevators a specialty.
Office, 191 Tremont Street, Boston.

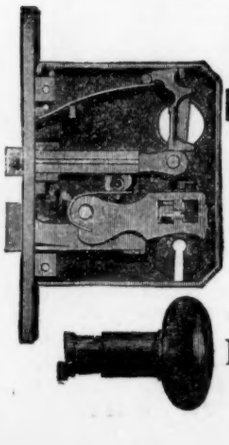
H. B. MARTIN,
51 & 53 W. Lake St., Chicago, Ill.
Manufacturer of
Patent Automatic
Parlor Passenger Elevators.
Complete without engine, steam or water. None too feeble to operate them.
Also, Paradox Hand-Elevators,*
Paradox Dumb-Waiters,
AND
* The Paradox Lever-Movement for Elevators and Dumb-Waiters for the Trade. Send for Circulars.

HYDRAULIC STEAM AND BELT ELEVATORS.
Hand-Hoists operated with ropes or cranks. Automatic Hatch-doors. Governors, and Safety-catches.
GEO. C. HOWARD.
Works, 1763 Barker Street, Philadelphia, Pa
New York Office, 12 Cortlandt Street.

M. B. SWEZEY,
Manufacturer of
IMPROVED DUMB-WAITERS
For Dwellings, with Automatic Catch.
120, 20th St., Chicago, Illinois.

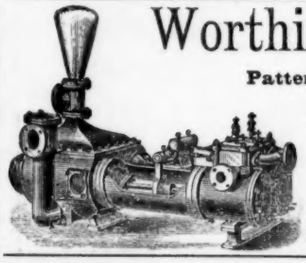
E. BREWER,
Hydraulic, Steam, Belt, and Hand
ELEVATORS, For Freight and Passengers.
267 Federal St., Boston. 149 Broadway, New York.
Send for Circular.

Nichols, Bellamy & Co.,
659 Washington St., Boston, Mass.
AGENTS FOR



NILES' PATENT LOCKS and KNOBS.
A Full Assortment of
Builders' Hardware.

WIRE LATHING,
ESPECIALLY ADAPTED TO
Public Buildings, Private Residences, Mills, Warehouses, Stores, and all Mercantile Structures.
IT IS POSITIVELY FIRE-PROOF.
WIRE LATHING possesses the following qualities:
IT IS NOT COSTLY.
IT IS EASILY AND CHEAPLY APPLIED.
PLASTERING ON THE WIRE LATH WILL NOT CRACK.
THE LATH WILL NOT CORRODE.
The plastering, when applied, clinches on both sides of the wire, forming a double surface.
THE WIRE LATHING is extensively used by the United States Government in its Custom House Court House, and Post Office Buildings.
It is indorsed by the leading Insurance Companies, who have applied it to their own fine edifices.
Full information given on application to the
CLINTON WIRE CLOTH CO., Clinton, Mass.
68 Beekman Street, New York. 148 Lake Street, Chicago.



Worthington Steam Pumps.
Patterns specially adapted to
HOUSE TANK SERVICE
And Hydraulic Elevators.
ABSOLUTELY NOISELESS.
HENRY R. WORTHINGTON - New York.
BOSTON, CHICAGO, ST. LOUIS, CINCINNATI, CLEVELAND, SAN FRANCISCO, PITTSBURGH

SHAFTING, PULLEYS, HANGERS.
F. Brown's Patent Friction-Clutch.
SEND FOR ILLUSTRATED CATALOGUE AND DISCOUNTS TO
A & F. BROWN, 43 Park Place. N. Y.

BUILDING MATERIALS.
Reported for the American Architect and Building News.

BRICK.—₱ M.	New York. (*Wholesale Prices.*)	Boston. (*Prices to Builders and Contractors.*)	Chicago. (*Prices to Builders and Contractors.*)	Philadelphia. (*Prices to Builders and Contractors.*)
Common: *Cargo afloat.*				
Pale	$3 00 @ $3 50	Eastern	Building Brick	Hard
Jersey	5 50 @ 6 00	7 00 @ 7 50	6 00 @ 7 00	@ 8 00
Long Island	@	Bay State Hard		Salmon
Up River	5 75 @ 6 25	9 00		@ 6 00
Haverstraw Bay	6 25 @ 6 50	Domestic Com.	Indiana Pressed	Stretchers
" 1st	6 50 @ 6 75	8 00 @ 9 00	16 00 @ 28 00	@ 11 00
Hollow	@ 13 00	Domestic Face	St. Louis Fronts	Pressed
Fronts:		19 00 @ 20 00	@ 27 00	20 00 @ 23 00
Croton, Brown	12 00 @ 13 00	Philadelphia		End Headers, all colors
" dark	@ 14 00	40 00 @ 45 00		@ 65 00
" red	@ 14 00	Phila. mould		Edge & End all colors
Chicago pressed		50 00 @ 80 00	22 00 @ 29 00	@ 85 00
Chicago Moulded			65 00 @ 350 00	
Baltimore	37 00 @ 41 00		@ 50 00	
Glens Falls—white	30 00 @ 35 00	Glens Falls		
Philadelphia	24 00 @ 25 00	25 00 @ 26 00	@ 45 00	
Trenton	24 00 @ 25 00		38 00 @	
Milwaukee		Glens Falls	25 00 @	
Moulded:		Mould.	60 00 @ 100 00	
Clark's Glens Falls—Red	25 00 @ 27 00	30 00 @ 35 00	30 @	
" —White	30 00 @ 35 00	35 00 @ 40 00	35 @	
White " Mold,	45 00 @ 60 00	45 00 @ 60 00	55 00 @ 65 00	
Enamelled: *Imp.*				
Enamelled (edge.)	85 00 @ 100 00	@	@ 100 00	Dom. { @ 65
Enamelled (edge and end)	90 00 @ 115 00	@	@ 120 00	@ 85
CEMENT, LIME, etc.—(₱ *cask.*)				
Rosendale Cement	@ 1 00	@ 1 40	*Not Sold.*	1 50 @ 1 75
Utica, Akron, Buffalo, Louisville, Milwaukee	*Not sold.*	*Not sold.*	1 00 @ 1 25	*Not sold.*
Portland, English (Gibbe)	2 50 @ 3 10	@ 3 20	3 00 @ 3 25	@ 3 50
" " (K. B. & S.)	2 75 @ 3 10		3 35 @ 3 50	@ 3 25
" " (Burham)	2 50 @ 2 80		3 15 @ 3 35	@ 3 00
" " (White's)	2 65 @ 3 00			
" German (Alsen)	2 50 @ 3 00	3 00 @ 3 50	3 15 @ 3 35	@ 3 25
" " (Fewer)	2 45 @ 2 70	3 15 @ 3 35	3 15 @ 3 35	
" " (Vorwohler)	2 50 @ 3 25		3 00 @ 3 25	
" " (Dyckerhoff)	2 75 @ 3 15	3 00 @ 3 50	3 25 @ 3 75	3 00 @ 3 2
" " (Lagerdofer)	@ 2 70	*Not sold.*	*Not sold.*	*Not sold.*
" " (Hanover)	2 50 @ 3 00		3 15 @ 3 35	2 50 @ 3 00
" French (Lafarge)	3 50 @ 4 50	*Not sold.*	3 75 @ 4 25	4 50 @
" American (Saylor's)	2 15 @ 2 30	2 15 @ 2 50	2 75 @ 3 00	2 50 @ 3 00
Selenitic		1 65	*Not sold.*	
Roman	2 75 @ 3 00	@ 3 20	2 75 @ 3 25	3 50 @ 3 75
Keene's coarse	5 00 @ 6 50	@ 7 50	8 00 @ 9 00	6 50 @ 7 00
" superfine	8 75 @ 11 00	@ 11 50	12 00 @ 13 00	11 50 @ 12 00
Lime:				
Lime of Teil	@ 5 00		*Not sold.*	
Hydraulic Lime	@ 1 45	@ 145		
Chicago Lime in bulk			65 @ 75	{ White Mash
Wisconsin "			80 @ 90	{ 1 25 @ 150
Rockland and Rockport, (Com.)	@ 1 00	@ 1 15	*Not sold.*	1 00 @ 1 00
Rockland and Rockport, finish	@ 1 20	@ 1 20	*Not sold.*	
State, com. cargo rates (nom.)	@ 90	*Not sold.*	*Not sold.*	*Not sold.*
State, finishing "	@ 1 10	*Not sold.*	*Not sold.*	*Not sold.*
Plaster of Paris (calcined.)	@ 1 25	1 65 @ 1 90	@ 1 75	2 00 @ 2 25
" (casting)	@ 1 35	@ 2 25	@ 2 00	2 25 @ 2 50
Hair (Cattle) ₱ *bush*	21 @ 25	@ 30	30 @ 35	20 @ 25
" (Goat)	30 @ 35	@ 30	35 @ 40	28 @ 33
Sand, ₱ *load*	1 00 @ 1 25	@ 1 50	100 @ 1 25	@ 1 50
STONE. (₱ *cubic foot, rough.*)				
Granite: (*Maine*)		@ 60		@ 2 00
Limestone:				
Bedford	@ 1 00	95 @ 1 00	50 @	3 75 @
Joliet	@		55 @ 58	
Lemont	@		38 @ 6	
Serpentine			80 @ 80	7 @ 1

(Continued on page ...)

10

FOR A SASH OF 250 LBS.

"MORTON'S METAL"

(Registered Trade-mark, May 1st, 1883.)

Cable and Champion Sash-Chains

and Patented Attachments.

The most **RELIABLE** and **CHEAPEST** article in the market for suspending

Window-Sashes.

HAS GREAT TENSILE STRENGTH,

Can be easily applied to any window, and gives SATISFACTION wherever used. Samples sent to any ARCHITECT free on application. Now in use in all the leading cities throughout the United States.

MANUFACTURED ONLY BY

THOMAS MORTON,

65 ELIZABETH ST., NEW YORK.

CHAMPION CHAIN.

BUILDING MATERIALS.

	New York. (Wholesale Prices.)	Boston. (Prices to Builders and Contractors.)	Chicago. (Prices to Builders and Contractors.)	Philadelphia (Prices to Builders and Contractors.)
Foundation:				
Dimension	@	5 00 ℔ ton	20 @ 28	30 @ 5 00
Block	@	4 60 ℔ perch	8 50 ℔ cord.	50 @ 6 00
Rubble	@	1 25 @ 1 50	8 50 @	
Bluestone: (℔ *sq. ft.*)				
Sidewalk	30 @ 5 00	40 @ 1 75	75 @ 1 00	70 @ 90
Planed	50 @ 6 00	75	50 @ 1 00	1 10 @ 1 25
Sandstone,				
Longmeadow		75 @ 85		
Kibbe		85 @ 95		
Brown (Connecticut)	1 00 @	1 25 @ 1 45	1 50 ℔ cub.ft.	1 35 @ 2 00
Amherst } Ohio	90 @ 95	90 @ 1 00	55 @ 65	
Berea } Ohio	75 @ 1 00	80 @ 90	45 @ 55	90 @ 1 10
Berlin } Ohio	75 @ 1 00	80 @ 90	55 @ 65	
Belleville	80 @ 1 25	1 25 @ 1 35	"	
New Brunswick and Nova Scotia	@ 1 00	75 @ 1 00	"	
Caen	@	@ 2 00	"	
Marble (℔ *cu. ft.*)				
Lee, Mass.	@	1 75 @ 2 50	*Not sold.*	2 00 @ 2 50
Rutland, white	@	@ 3 00	3 50 @ 6 00	2 25 @ 2 50
Sutherland Falls	1 25 @ 1 75	@ 2 00	3 50 @ 6 00	2 50 @ 4 00
Glens Falls, black	@	2 00 @ 3 00	*Not sold.*	4 00 @ 4 50
Italian, blue-veined	@	50 @ 60	@ 4 40	— @ —
" Sienna	@	3 00 @ 3 50	*Not sold.*	3 25 @ 6 50
Tennessee, red	@	1 25 @ 2 50	@ 4 00	2 00 @ 3 00
" Knoxville	@	85 @ 90	@ 4 00	@ 1 50
Pennsylvania, blue	@		*Not sold.*	2 23 @ 2 50
Vermont, white	@	1 50 @ 2 00	3 50 @ 6 00	
Slate: Roofing (℔ *square*)				
" green	7 @ 8 00	4 50 @ 7 00	6 25 @ 8 10	6 25 @ 7 00
" " unfading	@ 5 75	@ 5 75		
" purple	7 00 @ 8 50	5 50 @ 6 50	@ 8 60	@ 7 00
" red	@ 15 00	13 00 @ 14 00	— @ 16 00	@ 12 00
" black, Lehigh	— @ —	Brownville, Me.	7 20 @ 7 60	@ 4 00
" " Chapmans	— @ —	6 50 @ 9 00	7 30 @ 8 00	@ 4 50
" Unfading Black, Monson, Me.	5 50 @ 8 00	5 50 @ 8 00	6 00 @ 8 50	5 50 @ 8 00
Tiles, Am. ℔ M.	@		*Not sold.*	@ 15 00
N. Peach Bottom, warranted unfading				@ 3 85
LUMBER. — ℔ M.				
Boards: (*Ordinary dimensions.*)				
Pine, 1st quality, clear	65 00 @ 75 00	50 00 @ 53 00	44 00 @ 46 00	65 00 @ 75 00
" 2d quality	55 00 @ 60 00	42 00 @ 44 00	40 00 @ 44 00	55 00 @ 60 50
" 3d quality	18 00 @ 22 00	35 00 @ 38 00	37 00 @ 42 00	18 00 @ 22 00
Spruce	@ 25 00	11 00 @ 14 00	*Not sold.*	@ 22 50
Hemlock	ea. 17 @ 18	11 00 @ 12 50	@ 10 00	12 50 @ 15 00
Yellow pine	20 @ 40	30 00 @ 38 00	@ 28 00	17 00 @ 20 00
Cypress	@	32 00 @ 40 00	@	40 00 @ 55 00
Clapboards:				
Pine	@	33 00 @ 55 00	9 00 @ 20 00	—@—
Spruce	@	23 00 @ 35 00	*Not sold.*	—@—
Framing Timber:				
Pine			10 50 @ 13 50	25 00 @ 35 00
Spruce	13 50 @ 16 00	13 50 @ 15 00	*Not sold.*	18 50 @ 20 00
Hemlock	12 00 @ 15 00	@	10 00 @ 13 00	12 00 @ 13 00
Yellow pine	18 00 @ 25 00	21 00 @ 25 00		25 00 @ 30 00
Laths:				
Pine	@	2 25 @ 2 35	1 75 @	—@—
Spruce	@ 2 25	2 00 @ 2 25	*Not sold.*	2 35 @ 2 40
Shingles:				
Pine, shaved ℔ M.	5 00 @ 6 00	@	*Not sold.*	
Pine, sawed "	4 00 @ 5 00	@ 4 50	1 85 @ 2 45	
Spruce, sawed "	1 50 @ 2 00	@ 1 50	*Not sold.*	
Redwood ℔ 125	1 40 @ 1 60	3 75 @ 4 50	5 50 @ 8 00	30" $10 @ 28
Cedar, split ℔ M.	@	@	*Not sold.*	24" 8 @ 21
Cedar, sawed "	@	2 00 @ 4 00	@ 2 00	20" 5 50 @ 14
Cypress. Split....7 x 24. "	18 00 @ 20 00	5 50 @ 6 00	4 00 @ 4 50	13 00 @ 20 00
Miscellaneous:				
Piles ℔ ft.	4½ @ 5½	Piles 6c. ℔ ft.	*Not sold.*	
Fence pickets, Spruce	8 00 @ 10 00	10 00 @ 18 00	Pine, 8 @ 21	12 00 @ 14 00
Cedar posts, 9 ft. (sq. posts.)	@	25 @ 35	9 00 @ 21 00	70 @ 1 25
Chestnut "	@	25 @ 35	*Not sold.*	28 @ 36
Finishing Woods: ℔ M. (*First Qual. Kiln-dried.*)				
Ash	@ 55 00	38 00 @ 48 00	35 00 @ 40 00	45 00 @ 50 00
Cherry	80 00 @ 120 00	60 00 @ 90 00	75 00 @ 85 00	65 00 @ 90 00
Chestnut	@ 55 00	38 00 @ 50 00	45 00 @ 50 00	60 00 @ 80 00
Butternut	40 00 @ 60 00	60 00 @ 70 00	50 00 @ 60 00	70 00 @ 85 00
Mahogany, Baywood	@ 180 00	150 00 @ 160 00	150 00 @ 180 00	120 00 @ 150
" St. Domingo	@ 350 00	120 00 @ 350 00	250 00 @ 300 00	
Maple	45 00 @ 50 00	45 00 @ 65 00	30 00 @ 35 00	30 00 @ 50 00
Oak, red	@ 70 00	@ 50 00	35 00 @ 40 00	35 00 @ 45 00
" white	@ 70 00	@ 55 00	35 00 @ 40 00	55 00 @ 65 00
" quartered	@ 90 00	65 00 @ 70 00	45 00 @ 50 00	70 00 @ 80 00
Sycamore quartered		50 00 @ 65 00	45 00 @ 50 00	70
Pine, clear	65 00 @ 70 00	30 00 @ 65 00	45 00 @ 50 00	65 00 @ 90 00
Redwood	60 00 @ 70 00	60 00 @ 70 00	56 00 @ 65 00	100 00 @
Rosewood ℔ lb.	@ 8		@ 7	
Walnut, black	125 00 @ 150 00	85 00 @ 100 00	80 00 @ 100 00	160 00 @ 200 00
Whitewood	45 00 @ 50 00	38 00 @ 45 00	30 00 @ 35 00	20 00 @ 30 00
Yellow pine ℔ M.	@ 45 00	40 00 @ 45 00	30 00 @ 35 00	30 00 @ 35 00
Gumwood, best red			30 00 @ 35 00	
PAINTS. (*In oil,* ℔ *lb.*)				
White lead, Am.	5¾ @ 6	5 82-100 @ 6	@ 5½	4 @ 5½
" Zinc, "	5 @ 8½	5 @ 8	7 @ 11	4 @ 6
Red, Am., (dry)	6 @ 6½	6 @ 6½	@ 5½	
" Venetian (dry)	6 @ 10½	7 @ 12	1¾ @ 2½	
" Vermilion (dry)	65 @ 70	55 @ 60 dry	55 @ 60	Am. 14 @ 22
Red Indian, Eng. (dry)	12 @ 20	12 @ 20	12 @ 20	12 @ 20
Yellow Ochre (dry)	6 @ 15	7 @ 12	3 @ 15	7 @ 9
" Chrome (dry)	12 @ 20	18 @ 25	12 @ 25	12 @ 25
Green (chrome) (dry)	8 @ 13	8 @ 20	8 @ 20	9 @ 15
Green, Paris, (dry)	25 @ 40	25 @ 40	16 @ 35	16 @ 22
Black, lamp, (dry)	15 @ 25	15 @ 25	8 @ 30	8 @ 12
Blue, ultramarine (dry)	12 @ 18	18 @ 30	10 @ 35	11 @ 35
Oil, linseed, (raw) (℔ gal.)	51 @ 53	51 @ 56	50 @ 52	52 @ 55
" " boiled (℔ gal.)	54 @ 55	54 @ 59	53 @ 55	57 @ 59
Turpentine (℔ gal.)	33 @ 34	40 @ 47	35 @ 36	@ 45
Varnish, coach (℔ gal.)	@	1 50 @ 6 00	1 25 @ 2 00	1 75 @ 5 25
Shellac (℔ gal.)	@	2 50 @ 3 00	3 25 @ 4 00	1 10 @ 1 75
Putty (dry)	2 @ 3	2 @ 4	02 @ 03	2 @ 2½
Whiting (dry)	50 @ 90	1 @ 1½	1 @ 2	1 @ 1½
Paris white, (Eng.,) (dry)	2 @ 3	2 @ 3	2 @ 2½	1½ @ 1½
Litharge, Am. (dry)	5½ @ 5½	6½ @ 7	6½ @ 10	6½ @ 7½
Sienna (burnt) (dry)	12 @ 17½	14 @ 20	4 @ 16	9 @ 14
Umber, " (dry)	11 @ 16½	14 @ 20	@ 10	9 @ 14

F. W. DEVOE & CO.,

(Established 1852.)

Fulton Street corner William, NEW YORK,

MANUFACTURERS OF

White Lead Colors in Oil and in Japan.

Pure Ready-Mixed Paints.

Sample Cards of 50 desirable shades on request.

FINE VARNISHES.

Hard Oil-Finish, Wood-Stains and Finishes, Florentine Fresco Colors, Mathematical Instruments.

Engineers' Supplies, Levels, Chains, Cross-Section Papers, Blue-Process Papers, etc.

Illustrated Catalogue of Engineers' Supplies. 250 Pages, 700 Illustrations.

Sent on request.

COFFIN, DEVOE & CO.,

176 RANDOLPH STREET, CHICAGO.

FISCHER-LEAF CO.

—MANUFACTURERS OF—

Marbleized-Iron and Slate Mantels, Grates, Stoves and Hollow-Ware, and dealers in

AMERICAN, ENGLISH and FRENCH TILE.

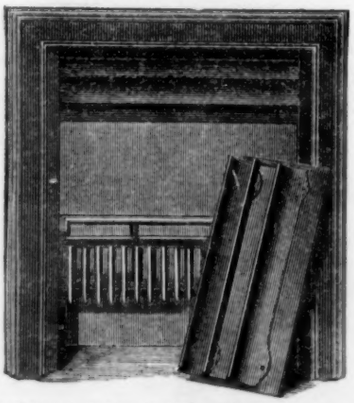
Send for Catalogue, and Prices

351 to 357 Jefferson St., Louisville, KENTUCKY.

RICKETTS'

Patent Fireplace

IS THE BEST.



Radiates more heat. No smoke or dust. Requires less fuel.

Chas. J. Smith, Agent,

200 Main Street,

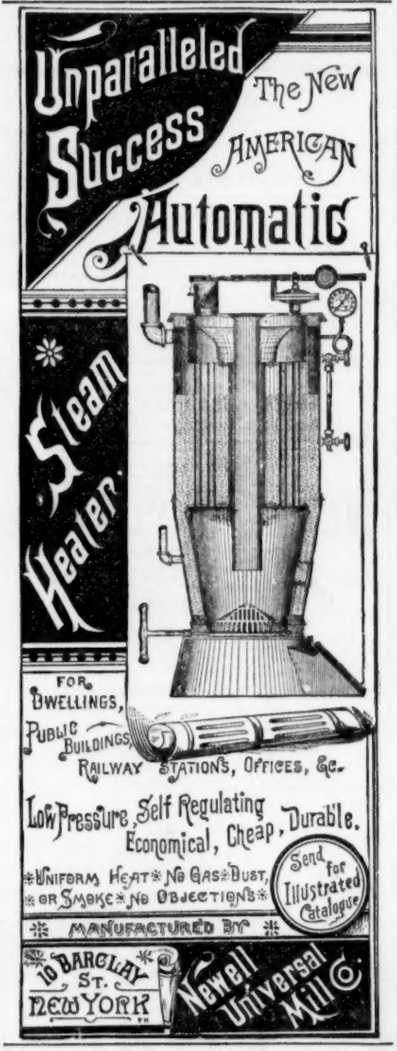
CINCINNATI, OHIO.

The GOODWIN GAS STOVE & METER CO.,
MANUFACTURERS OF
The Sun Dial Gas Cooking and Heating Stoves.

The most economical in use. Over 50 different kinds. Suitable for Families, Hotels, Restaurants and Public Institutions. Laundry, Hatters' and Tailors' Heaters. Hot-Plates, Warming-Closets for Pantries. Hot-Water Generators, etc., etc.

1012-1016 Filbert Street, Philadelphia.

142 Chambers Street, New York.
126 Dearborn Street, Chicago.
Waldo Bros., Agts., 88 Water St., Boston, Mass.


Unparalleled Success
The New American Automatic
Steam Heater
FOR DWELLINGS, PUBLIC BUILDINGS, RAILWAY STATIONS, OFFICES, &c.
Low Pressure, Self Regulating, Economical, Cheap, Durable.
UNIFORM HEAT NO GAS DUST, OR SMOKE NO OBJECTIONS
Send for Illustrated Catalogue
MANUFACTURED BY
10 BARCLAY ST. NEW YORK
Newell Universal Mill Co.

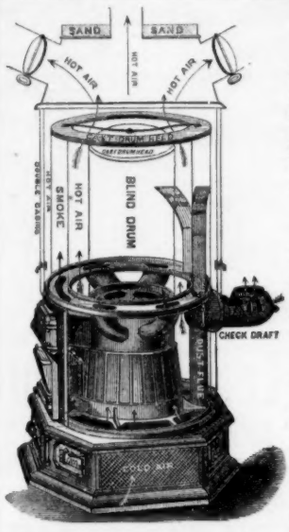
SHIELDS & BROWN,
78 & 80 Lake Street, - Chicago, Ill.
MANUFACTURERS AND SOLE PROPRIETORS OF
BRADLEY'S

FOR BOILERS AND STEAM PIPES.
Reduces Condensation of Steam.
FOR GAS AND WATER PIPES.
Prevents Sweating and Freezing.
The best Non-Conductor of Heat and Cold in the World.
Send for illustrated descriptive Circular, and name this paper.

SLATE MANTELS
Of the latest and most beautiful designs, and all other Slate and Soapstone work on hand or made to order. JOSEPH S. MILLER & BROTHER, 1210 Ridge Avenue, Philadelphia, Pa. Successor to Wilson & Miller.
Send for Illustrated Price-List.

W. H. HARRISON & BRO.,
Manufacturers,
PLAIN AND ARTISTIC
GRATES
AND FIREPLACES
A SPECIALTY.
Also, **Furnaces and Ranges.**
Send for Illustrated Catalogue. 1435 Chestnut St., Philadelphia

Heating and Ventilation.



A Brief Description of the
Novelty Hot-Air Furnace
has run for several issues that all might be acquainted with its character and qualities, which enables a comparison when its superiority becomes apparent. We call attention to a few of its special features and give some informative experience.

Immense Heated Surface Exposed, The Economical Consumption of Fuel, Its Prolonged Durability under Severe Test, Perfectly Self-Cleaning, avoiding Annual Expense, Entirely Free from Gas and Dust, Superior Operation, Convenient, Easily Managed.

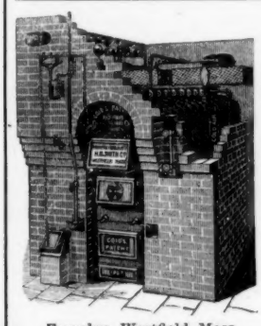
THE PREVAILING OPINIONS.

MARTINSBURG, W. VA., October 14, 1884.
MR. J. H. BLONDEL.
Dear Sir, — The two Furnaces which your father put in the St. Joseph's Catholic Church *nine years* ago, under a guaranty to do the work, have given every satisfaction, and have *never yet needed repairs.* I with pleasure recommend the Novelty Furnace, and would be glad to see them in all of our churches.
H. J. MCKEEFRY, Pastor.

HAMPTON, VA., April 14, 1885.
ABRAM COX STOVE CO.
Gentlemen, — The No. 40 Novelty I placed in our Baptist Church 18 months ago has given entire satisfaction. The church is 50′ x 52′, ceiling 24′, and all parts were comfortable during the zero weather of this winter. It is perfectly free from gas and dust, an important feature for church use, while the check draft is convenient and effectual. Take the Heater all in all, I am very much pleased with it, as it is first-class in all essentials. Yours very truly,
G. M. RICHTER.

ABRAM COX STOVE CO., 144 No. Second Street, Philadelphia, Pa.

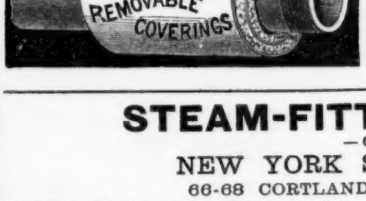
JOHN DAVIS & CO., Contractors for
STEAM HEATING & VENTILATING
For Stores, Hospitals, Factories and all Public Buildings. Estimates and specifications furnished for direct and indirect heat. Boilers of superior quality and design; also Steam Pumps, Iron Pipe and Fittings. Call or address
71 to 75 Michigan Street, CHICAGO.



Foundry, Westfield, Mass.

THE H. B. SMITH CO.,
MANUFACTURERS OF
The Union Steam and Water
HEATING APPARATUS,
For Public Buildings and Private Residences.
Also Manufacturers of
Reed's Improved Cast-Iron **Radiators,**
Mill's Safety Sectional Boilers,
Gold's Indirect Pin Radiators, etc.
Office and Warerooms, 137 Centre St., New York.

STEAM WARMING.
BATES & JOHNSON,
114 LEONARD STREET, - - - - - - NEW YORK.
59 West Water Street, Syracuse. 310 Broadway, Albany.
House Warming a Specialty. Estimates Furnished on Application.



PIPE-COVERING.
This covering is made entirely of Asbestos, and can n be affected injuriously by heat or dampness, nor can it be made a harbor for vermin.
[Asbestos Building-Felt, Fire-Proof Cements, &c.
THE CHALMERS-SPENCE CO.,
419-421 E. 8th Street - - NEW YORK.

STEAM-FITTING DIVISION
— OF THE —
NEW YORK STEAM COMPANY,
66-68 CORTLANDT STREET, NEW YORK.
Contractors for Steam-fitting of every description. Work executed from the designs of Architects and Engineers. Plans and Specifications furnished. Correspondence solicited.
General Offices,
22 CORTLANDT ST., N. Y.
Superintendent, H. M. SMITH,
Heating and Ventilating Engineer.

ALBERT A. RILEY,
DEALER IN
Mantels and Grates,
Brass Fire-places, Tile Hearths and Facings, Brass Fenders, Andirons, Fire-sets, Coal-Hods, Etc.
Wood Mantels a specialty.
178 WABASH AVE., CHICAGO.

BIBB'S
Celebrated Original
BALTIMORE
FIRE-PLACE HEATERS,
To warm upper and lower rooms. The handsomest, most economical Coal Stoves in the World.
B. C. BIBB & SON,
Foundry, Office and Sales-room,
39 AND 41 LIGHT STREET,
Baltimore, Md.
MARBLEIZED SLATE MANTELS
Send for Circulars.

Established 1827.
W. JACKSON, & SON,
Manufacturers and Importers of
Grates, Open Fireplaces,
Fenders, Fire Irons, etc.
1166 Broadway, Bet. 27th & 28th Sts.
246 Front Street, Near Peck Slip,
New York.

J. REYNOLDS & SON,
FURNACE MANUFACTURERS.
Kitcheners, Grates, etc.
Send for Catalogue.
13th and Filbert Streets., Philadelphia, Pa.

GLOBE VENTILATORS & CHIMNEY CAPS.

Public and Private Buildings and Railroad Cars Perfectly Ventilated.

SMOKY CHIMNEYS CURED!

STATIONARY, ORNAMENTAL, NOISELESS, STORM-PROOF, DURABLE, SIMPLE, and CHEAP.

Send for Price-List. Working Model sent on receipt of 20 cents, to pay postage. Manufactured and for sale by

GLOBE VENTILATOR CO.

Office: 203 River Street, Troy, N. Y.

Wholesale Agents for Albany and vicinity, Hoy & Co., Nos. 25 and 27 Green St., Albany, N.Y
Wholesale Agents for New York City and vicinity, George H. Moseman, 28 Cliff St., New York City.
Wholesale Agents for Philadelphia, Pa., and vicinity, Merchant & Co., 525 Arch St., Phila.
Wholesale Agents for Nebraska, Idaho, Montana, and Wyoming, Milton Rogers & Son, Omaha, Neb.
Wholesale Agents for Milwaukee & Vicinity, Rundle, Spence & Co., 89 West Water St., Milwaukee, Wis.
Wholesale Agents for Boston, Mass., and vicinity, Chas. M. Bromwich, 613 Broadway, South Boston.
Wholesale Agents for Chicago, Ill., Sargent, Greenleaf & Brooks, 45 and 45 Franklin St.
Wholesale Agents for Louisville, Ky., George L. Smith, 167 First St., Louisville, Ky.
Wholesale Agents for Canada, Hughes & Stephenson, 745 Craig St., Montreal, Can.
Wholesale Agents for St. Louis and vicinity, N. O. Nelson & Co., Eighth and St. Charles Sts.
Wholesale Agents for Ogden, Utah, and vicinity, D. D. Jones, Main St., Ogden, Utah.
Wholesale Agents for Rochester and vicinity, E. H. Cook & Co., (Limited) 31 Mill St., Rochester, N. Y.
Wholesale Agents for Minnesota, Wilson & Rogers, 24 East Third St., St. Paul, Minn. Wholesale Agents for Cincinnati and vicinity, H. McCollum & Co., 262 Race St., Cincinnati, O.
Wholesale Agents for Baltimore, Md., Lyon, Conklin & Co., 27 and 29 Light Street, Baltimore, Md.
Wholesale Agents for Detroit, Mich., and vicinity, Dry-Dock Sheet-Metal Works, cor. Orleans and Franklin Sts., Detroit, Mich.

Clover-Leaf Ventilators

AND CHIMNEY CAPS,

For Public & Private Buildings, etc.

Specially adapted for Sanitary Plumbing.

SURE CURE FOR SMOKY CHIMNEYS.

Cheapest and most effective Ventilator on the market. Working models mailed on receipt of 20 cents. Absolutely storm-proof. A down current creates an up draft.

MANUFACTURED AND FOR SALE BY

E. VAN NOORDEN & CO.,

389 Harrison Ave., Boston, Mass.

AGENCIES:

Stambach & Love, Philadelphia; Peck Bros. & Co., New York; Reuter & Mallory, Baltimore, Md.; Pierce, Butler & Pierce, Syracuse, N. Y.; A. Mollo, New Orleans, La.; M. M. Murphy & Co., Cleveland, Ohio; Jas. B. Scott & Co., Pittsburgh, Pa., Detroit Lead Pipe and Sheet-Lead Works, Detroit, Mich.

THE FLORIDA

House - Heating Boiler.

(Catchpole's Improved.)

The cheapest and most economical Low-pressure Steam Boiler in use. Illustrated Catalogue free.

The FLORIDA BOILER WORKS, Geneva, N. Y.

OUR HOMES

HOW TO HEAT & VENTILATE THEM.

An attractive book of 72 pages containing illustrations of some of the finest residences in the country. It is a complete Manual on the subject of Sanitary Heating and Ventilating.

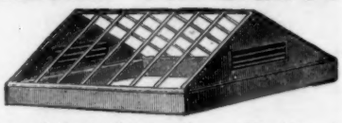
Mailed free on receipt of 4 cents in stamps.

SMITH & ANTHONY STOVE CO.

52 & 54 Union St., - - Boston, Mass.

Skylights.

METAL SKYLIGHTS.



Warranted absolutely Storm, Weather, Fire and Condensation Proof, Free from Leakage from any source.

Skylights and Glass furnished and put up by us in any part of the country.

Ventilators and Chimney Caps or Smokey Chimneys.

CORRUGATED IRON ROOFING AND SIDING.

GARRY PATENT IRON ROOFING AND IRON SHINGLES.

Galvanized Iron Cornices, Window Caps, Copper Gutters and Conductors.

E. VAN NOORDEN & CO.,

389 HARRISON AVE., - - BOSTON.

ST. LOUIS

Steam Heating and Ventilating Co.,

CONTRACTORS FOR

HEATING BY STEAM

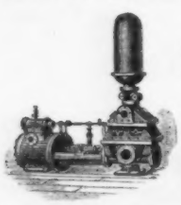
Stores, Residences, Churches, and all Public Buildings. Plans, Specifications and Estimates furnished.

No. 621 OLIVE STREET, ST. LOUIS, MO.

THE HAYES SKYLIGHTS VENTILATORS ETC. ESTB 1868 71 8 AVE NY.

KNOWLES STEAM-PUMP WORKS,

BUILDERS OF



Steam and Power Pumping Machinery,

For City and Town Domestic Supply.

Also Sewerage-Pumping Machinery.

ADDRESS

93 Liberty St., New York. 44 Washington St., Boston.

SEND FOR ILLUSTRATED CATALOGUE.

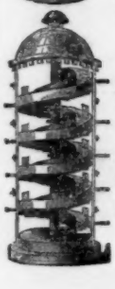
Pardessus' Exhaust Ventilating Sky-Lights

DOME, HIPPED, And usual styles, METAL OR WOOD FRAMES.

DOME EXHAUST VENTILATOR CAP.

Natural Heat only relied upon, no foul Air, no Smoky Chimney with these caps in use. Cheap and most effective.

DOUBLE PASSAGE, QUICK FIRE REACH, AND PRACTICAL FIRE-ESCAPE.



Absolute safety to occupants of lofty buildings, in rescuing Invalids, the feeble and timid, as well as the able, without harm.

No danger from smoke, flame, ice, freezing or exposure.

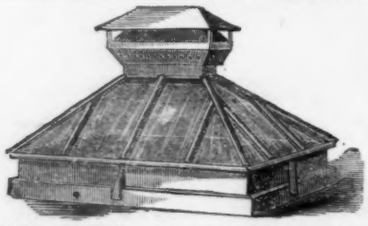
A Descriptive Illustrated Pamphlet of each of the above sent at request.

S. J. Pardessus, Patentee

10 and 12 COLLEGE PLACE, Bet. Barclay & Park Place, NEW YORK.

THE BROOKLYN

METALLIC SKYLIGHT WORKS.



JOHN SETON, 78 and 80 Washington Ave., BROOKLYN, N. Y.

☞ Send for new illustrated catalogue and price-list.

BICKELHOUPT'S

METALLIC SKYLIGHTS.

NO INFRINGEMENT on any other.

Are the Cheapest and Best. Manufactured by

BICKELHOUPT BROTHERS,

218 West 37th Street, New York.

Send for Illustrated Catalogue.

The Temporary Binder

Provided by us will keep your copies of the *American Architect* in PERFECTLY uninjured condition.

Price $1.25, post paid.

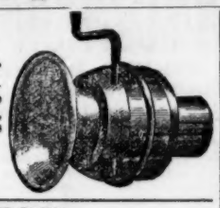
Furniture and Interior Work.

Ostrander's New Oral Annunciator.

Superior in every respect. No Batteries or Wires.

Hotels, Apartment-Houses, Residences, Offices, Factories, etc. fitted in any part of the Country. Complete Outfits of Speaking-Tubes, Whistles, Pneumatic-Bells, etc., furnished. Send for New Catalogue. Estimates furnished.

W. R. OSTRANDER & CO.,
21 and 23 Ann St., New York.



THE BURROWES, PATENT, SLIDING,

Wire Window Screens,

And Improved Screen Doors,

Are in use in thousands of houses in all parts of the United States, particularly in larger cities and towns.

The Window Screens may be used inside or outside, slide to upper or lower sash, are held in place by steel springs, and may be instantly removed by pressing to one side.

We make twelve times as many screens as any other concern in the country, and the only screens suitable for a good house. **Special Low Prices for this time of year.**

Send for Circular, Price-List and Pamphlet. Pamphlet contains testimonials from prominent architects and citizens from nearly every state, and cuts of twenty modern dwellings. Free by mail. Address

E. T. BURROWES & CO., - - Portland, Maine.

Moorish Fret-Work,

— OR —

INTERLACED WOOD-WORK.

Unequalled for Interior Decorations, Spiral Mouldings, and Balusters.

C. S. RANSOM & CO.,
Cleveland, Ohio.

IMPROVED SEATING,

For Schools, Churches, *Halls &* OPERA HOUSES.

Send for Catalogue showing 20 Best Styles manufactured by

A. H. Andrews & Co.,
Successors to
BAKER, PRATT & CO.

518 Arch St., Phila. | 195 Wabash Av., Chicago. | 19 Bond St., N. Y.

METALLIC FRAME
WIRE WINDOW-SCREENS

Send for circular and references.

Over 15,000 in Use.

AMERICAN SCREEN CO.,
Brookline, Mass.

Marble Mosaic Pavements,

Also Wall-Decorations in Mosaics, of either Marble, or Colored & Gold-Glass.

We employ Native Italian Artists specially trained for this work.

STILLMAN & NICOLL.
198-200 Tremont St. - Boston.

DEGRAAF & TAYLOR
FURNITURE
47 & 49 West 14th St., New York.

SETTEES AND OPERA CHAIRS.

The Newest & Best Styles for SUNDAY SCHOOLS, CHURCHES, OPERA-HOUSES, LODGEROOMS, HALLS, OFFICES, &c.

Harwood Man'f'g. Co.,
91 Summer St., Boston.

Send for catalogue and state requirements.

"OTTO" GAS ENGINE,

Guaranteed to consume 25 to 75 per cent less gas than any other Gas Engine per brake-horsepower.

Over 15,000 IN USE.

TWIN ENGINES

Impulse every Revolution.

The steadiest Gas Engine yet made.

ENGINES and PUMPS COMBINED

For Hydraulic Elevators, Town Water Supply or Rail way service. Special Engines for Electric-Light work Unexcelled for running Elevators, Wood-Tools, or any kind of Machinery.

SCHLEICHER, SCHUMM & CO.,
33d and Walnut Sts., Philadelphia. | 214 Randolph St., Chicago.

ROYAL GAS MACHINE.

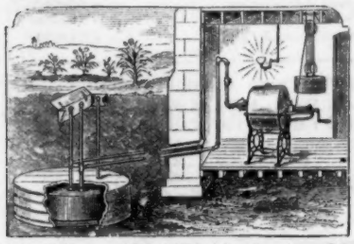
Hotels. Churches. Factories. Colleges. Asylums. Private Residences all use it.

Street Lamps. All Designs. Posts. Gasoline. Naphtha. Crude Oil, for Gas Works.

No Smoke!! No Smell!!!

ADDRESS
PENNA GLOBE GAS LIGHT Co.
47 & 49 No. 2d St., Phila. Pa.

The Combination Gas-Machine Co.



DETROIT, MICH., and WINDSOR, ONT.,
MANUFACTURE

Gas-Machines

—FOR—

Lighting Churches, Hotels, Residences, Stores,

Or any place wanting artificial light.

The Oldest and Best Machine in use. Over 4,000 Machines in successful operation. Send for Illustrated Catalogue.

W. C. RUNYON & CO.,
Cor. Hebard St., and N. Y. Central & Hudson River R. R.
ROCHESTER, N. Y.
Manufacturers of
Patent Lead Joined
END-UP
WOOD-MOSAIC.

Special designs for floors and wainscoting furnished on application

Send for Catalogue.

WESTERN ELECTRIC CO.,
Chicago, Boston, New York.
Electric Call-Bells and Annunciators,

For Hotels, Residences, Offices, etc. Electric Burglar-Alarms, Electro-Mercurial Fire-Alarms. Electric Gas-lighting Apparatus. Telegraph Instruments and Supplies.

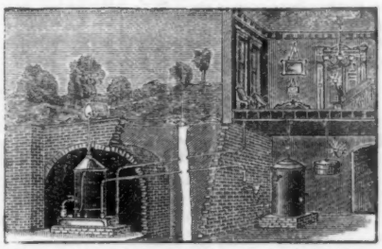
Electric Light Wiring

CONTRACTORS.

Greenfield & Klein, 39-41 Ann St., New York, Incandescent Electric Lamps for use with battery. *Call-Bells, Burglar-Alarms,* Batteries and all *Electrical Supplies.*

Correspondence solicited.

THE only "Dry Blower" Gas-Machine made. No water about it to freeze. Makes gas for 75 cents per 1,000 feet.



Latest invention of the inventor of the Dry Gas-Meter.

PITTSBURGH SUPPLY CO.,
(LIMITED.)
105 WOOD STREET, PITTSBURG, PA.

SEND FOR CATALOGUES.

TIRRILL'S EQUALIZING GAS MACHINE.

Makes Standard, Uniform Gas, wirhout Fire, Danger, Smoke or Smell, using plain Bat-wing Burners.

The only Machine in the world that can reliably do it. Send for circulars, and see who endorses this statement.

TIRRILL GAS MACHINE CO.
39 Dey St., N. Y.

IMPERIAL GAS MACHINE.

DENNY BROS. & CO.,
34 Park Place, New York.

In use throughout the world. Send for descriptive pamphlet.

ESTABLISHED 1836.

JOHN FARQUHAR'S SONS,

SLATE, METAL, AND COMPOSITION ROOFERS.

Nos. 20 and 22 EAST STREET, BOSTON.

Order Box, No. 83 Mechanics Exchange, No. 35 Hawley St.

Agents for Warren's Patent Natural Asphalt Roofing. Special attention given to repairs of all kinds of Roofing.

Inventors and Owners of the following Patents: *First*, Patent Fastener for securing Slates or other covering to iron Purlines where the roof is wholly of iron. *Second*, A Roof composed of Wooden Rafters encased in Asbestos, Sheet Metal, or other fire-proof material, to which Iron Purlines are fastened, and the slates or other coverings secured by our Patent Fastener. The slates are then rendered underside with hair mortar or any other material. The object intended being a Light Fire-proof Roof, avoiding all condensation and preventing leakage.

THE

NEUCHATEL ASPHALTE CO.,

Sole Proprietors of the

Val de Travers Rock Asphalte Mines,

Canton de Neuchatel, Switzerland.

Val de Travers Rock Asphalte,

For Floors, Sidewalks, Roofs, &c.,

Durable, Fireproof, and Impervious.

For estimates and full particulars apply to office, No. 54 Astor House, New York,

HENRY R BRADBURY, Manager.

EDWIN A. JACKSON & BRO.,

77 Beekman Street, NEW YORK.

Heat-Saving and Ventilating GRATE.

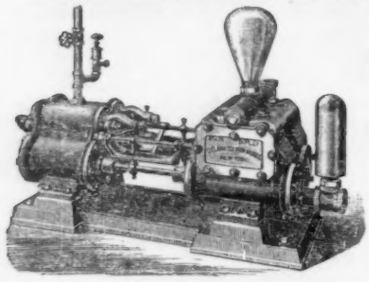
The grate thoroughly warms and ventilates my study, 18 x 28 feet.
Stanley Matthews, (U. S. Supreme Court).

I heat two rooms on first floor and a bed-room above with one grate.
John McConnell, Monticello, Ind.

My grate heats a parlor and a bed-room above when the mercury has ranged from 32 to 38 degrees below zero.
A. L. Strong, Vail, Iowa,

Its working has seemed to me absolutely perfect.
Edw. H. Jenks, Concord, N. H.

DELAMATER DUPLEX STEAM-PUMPS.



The most approved

STEAM PUMPS

Now on the United States' market for

Hydraulic Elevators,

House Tank Service,

Railway Water Stations, etc.

Water-Works Pumping Engines.

SEND FOR CATALOGUE.

DELAMATER IRON WORKS.,

40 Dearborn St., CHICAGO.

16 CORTLANDT ST., New York.

Works, foot W. 13th St.,

PEET VALVE CO.,

Manufacturers of

DOUBLE GATE-VALVES

—FOR—

STEAM,

WATER,

GAS, Etc.

163 Albany St., Boston.

K. B. & S'. ENGLISH.
GIBBS & CO.'S ENGLISH.
STETTINER GERMAN.
LAGERDORFER GERMAN.
FIEVE A 1 BELGIAN.
ROMAN CEMENTS.
KEENE'S CEMENTS.

Send for Circulars and Price Lists.

HOWARD FLEMING,

23 Liberty St., New York.

IMPORTER OF

PORTLAND CEMENTS

FROM THE BEST MAKERS.

Water-Proof. ROOFING FELT. SHEATHING FELT. BUILDING PAPER. Air-Tight.

COMPLETE ROOFING.

Deadening Felt, Roofing Materials, Asphaltic Cement for damp walls, foundations, etc. Send for Samples and Price-List.

WARREN EHRET ROOFING CO.,

Limited.

108 South Second Street, Philadelphia, Pa.

JENKINS BROTHERS' VALVES.

adiator, Gate, Globe, Angle, Check and Safety.

MANUFACTURED OF BEST STEAM METAL.

The Jenkins Discs used in these Valves are manufactured under our 1880 patent, and will stand 200 pounds steam pressure.

To avoid imposition, see that Valves are stamped "JENKINS BROS."

JENKINS BROTHERS,

71 John St., New York. Send for Price-List "A." 79 Kilby St., Boston.

Solid Braided Window-Sash Cord.

The SAMSON cord is the most durable. Manufactured by

J. P. TOLMAN & CO.,

164 High Street, Boston.

ARCHER & PANCOAST MFG. CO.

GAS-FIXTURES.

BOSTON.	NEW YORK. 67 Greene Street.	CHICAGO.
12 West Street.	68, 70, 72 Wooster Street.	250-252 Wabash Ave.

American Fire Insurance Co., Phila.

CASH CAPITAL	400,000.00
Reserve and Liabilities	852,970.05
Surplus	551,548.96
Total Assets Jan. 1, 1884	1,804,519.21

INSURANCE CO. OF NORTH AMERICA, - - of Philadelphia

Cash Capital	$3,000,000.00
Reserve for Re-Insurance	2,156,781.63
Reserve for Unadjusted Losses and other Liabilities	473,492.82
Surplus over all Liabilities	3,250,778.61

Wilson's Rolling Venetian Blind.

A very DURABLE, HANDSOME and CONVENIENT piece of Window Furniture. It takes the place of the cumbersome folding shutters, saving the studding-out and boxing, and giving extra room. Can be fitted with lower sliding panel so as to close either half of window. Running in grooves, it does not shake or rattle, and is a protection against thieves.

WILSON'S ENGLISH VENETIAN BLINDS,

To pull up with cord. (See cut.)

Wilson's New Patent Double Edged

ROLLING STEEL SHUTTERS,

Fire and Burglar Proof. Will outlast three or four sets of any other make.

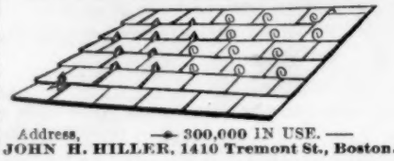
"The Hartford" Folding Blind and Wilson's Flexible Car Blinds.

Send for Illustrated Catalogue.

J. G. WILSON, 527 and 529 W. 22d Street, New York.

SPECIFICATIONS SHOULD INCLUDE

Folsom's Patent Roof Snow-Guards.



Address, JOHN H. HILLER, 1410 Tremont St., Boston.

—300,000 IN USE.—

THE AMERICAN ARCHITECT AND BUILDING NEWS.

VOL. XVIII

Copyright, 1885, JAMES R. OSGOOD & Co., Boston, Mass.

No. 497.

JULY 4, 1885.

Entered at the Post-Office at Boston as second-class matter.

CONTENTS.

SUMMARY: —
Death of John R. Niernsée, Architect. — Proposed Admission of Architects to the National Academy. — The Prize Competition of the Society of Architects of Lyons. — Settlement of the Question of the Right to build on disused Cemeteries. — Some Considerations concerning Lightning. — The Parson Steam Turbine. 1
ARCHITECTURAL TERRA-COTTA. — II. 3
TALL CHIMNEY CONSTRUCTION. — II. 4
THE ILLUSTRATIONS: —
Design for the Chamber of Commerce, Cincinnati, O. — Boston Terra-Cotta Company's Premises, Boston, Mass. — Competitive Designs for Stables. 6
CONSTRUCTION OF THE BROMPTON ORATORY CUPOLA. 7
THE RELATIONS BETWEEN ENGINEERING AND ARCHITECTURE. . 8
COMMUNICATIONS: —
Sgraffito Work in This Country. — Fresh or Stale Portland Cement. 9
NOTES AND CLIPPINGS. 10

MR. JOHN R. NIERNSÉE, one of the oldest and most respected architects in the United States, died in Columbia, South Carolina, on the 7th of June. Mr. Niernsée was born and educated in Vienna, but came to this country when a young man, bringing with him the well-trained mind which German technical education gives. Engineers of high theoretical attainments were not so common here forty years ago as they are now, and he soon found employment under the United States Government in the survey of the coast of Georgia and Florida, and, later, in the construction of various important fortifications on the Southern coast. Returning from these duties, he settled in Baltimore, where he was employed by the Baltimore & Ohio Railroad Company, and gained at the same time some note as an architect. A few years before the war, he was selected as the architect of the new State-House which the State of South Carolina had determined to erect, and removed to Columbia, to devote himself to the work. The building was still unfinished when the war broke out, interrupting building operations completely; and he returned to Baltimore, where he continued to practise his profession quietly, but with ever-increasing success. In 1873, on the occasion of the great Industrial Exposition in Vienna, he was chosen as the United States Commissioner to the Exposition, and revisited in that capacity the home of his early years. A few years later, he was selected by the trustees of the Johns Hopkins bequest as consulting architect in the construction of their noble hospital buildings, and continued to act in that capacity until called South by the Government of South Carolina, which had determined to resume the construction of its State-House, and requested its former architect to assume again the direction of the work so unhappily interrupted. Although nearly twenty-five years had passed since he laid down his pencil in Columbia, Mr. Niernsée gladly accepted the invitation to complete the most important of his works according to his original intention, and removed again to Columbia, but he had hardly entered upon his duties before he was attacked with an illness which soon proved fatal. In private life Mr. Niernsée was one of the most amiable and honorable of men, devoted to his profession and zealous for the interests of its members. He was one of the earliest members of the American Institute of Architects, and did much to gain for it the reputation and authority of which his successors now enjoy the benefit.

A PROPOSITION has been made to extend the membership of the National Academy of Design so as to include a certain number of architects, who would be elected to the two grades of associate and full members, just as architects of distinction are admitted to the Royal Academy in England, or the Institute of France. Whether the proposition is likely to be carried into effect we do not know, but it seems to us that such a change in the constitution of the Academy might be productive of good, both to architects and to the painters and sculptors who now alone enjoy active membership, although several architects have been elected honorary members. It is much to be desired that architects and other artists should be brought more together in this country, and every movement for bringing about more intimate relations will be warmly promoted by those who best understand the advantages to be gained in this way. Most architects who interest themselves in the successes of their professional brethren have probably observed that the highest reputation has almost always come to men who, either from inclination or through the habits acquired abroad, have sought the acquaintance and coöperation in their work of the best artists. Whether the painters and sculptors in these cases have gained fame by reflection from that of their friend the architect, or whether he has borrowed plumes from them, is of less importance than the fact that the joint work of two or three men of different artistic professions working together has in several conspicuous instances gained for each a good deal more reputation than either could have acquired by the same amount of labor independent of the other. Something of this effect may perhaps be due to the novelty of the combination, but much ought also to be attributed to the influence of each in criticising and inspiring the other, and to the redoubled power which two artists, enforcing at once the same sentiments by different modes of expression, can give to the design on which they work together. It is true that the simple election of a man as a National Academician would not imbue him with artistic feeling, or secure to him always the coöperation of his brother Academicians in his work; but it would do something to interest him in other artists, and them in him, while the admission of architectural drawings to the annual exhibitions would do still more, and the social intercourse which it is intended to promote in the Academy by regular meetings of the members would perhaps do most of all; and the mutual acquaintance of persons of tastes so similar could not fail to be in some way pleasant and serviceable to all.

THE Society of Architecture of Lyons, as our readers will remember, holds each year a competition, open to all architects, upon a given programme, offering as prizes medals of gold and silver. The programme for the present year proposes a design for a law-school. The building is supposed to be situated in a lot bounded by four streets, and to be set back on all sides from the street line; the intervening space being planted with shrubbery. The plan must include a large *salle des Pas Perdus*, or waiting-room, after the French manner, from which must open three court-rooms. One of these court-rooms is to be devoted to public exhibitions and distributions of prizes, and must be large enough to accommodate three hundred spectators, besides all the professors and dignitaries, who are to have a platform to themselves. The two other court-rooms must hold one hundred and fifty persons each, and each is to be provided with a seat for the judge. Besides these, six lecture-rooms must be provided, each having an area of about one hundred square metres, and a library, to contain twenty-five thousand volumes, with one or two general reading-rooms, to accommodate fifty readers in all, and a special reading-room for the professors, and offices for the librarian and his assistant. Each of the twenty professors is also to have a room to himself; and a general meeting-room for all the instructors, with a dressing-room and ante-room, must be provided, besides an office and ante-room for the dean, and a suite of at least ten rooms for the habitation of the dean and his family. The secretary must also have a lodging, consisting of five rooms, and the janitor and his assistant must each have rooms. Five drawings are required, all at a small scale. The plans of the first and second story only are called for, at one two-hundredth the full size, or about one-sixteenth of an inch to the foot, with the principal elevation and a longitudinal section at double this scale, and a detail, either of the façade or the section, at one-twentieth the full size. The drawings are to be delivered to the Secretary of the Society of Architecture, at the Palace of Fine Arts in Lyons, on or before the sixth day of December next, and the designs will first be examined by a committee of seven members of the Society, who will present a report upon them; and the prizes are finally to be awarded by the vote of the whole Society. We hardly suppose that any of our readers are likely to enter a contest so remote, but it will do no harm to suggest to the younger ones, particularly those who have the necessary leisure, that there is no more valuable exercise than an occasional effort, carried out to reasonable success, at solving an extensive, but well-studied

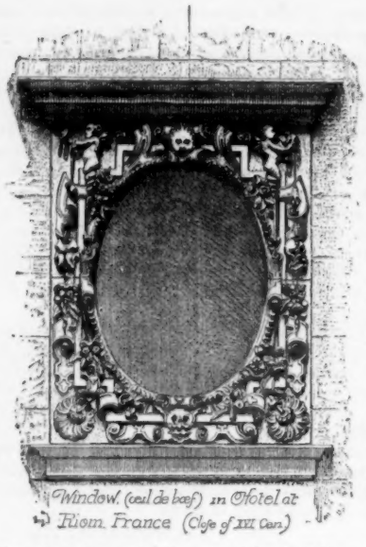
programme like this. An architect who is not sometimes called upon to design large and monumental buildings loses the capacity for thinking architecturally in a monumental way which he ought to have acquired in his student days, and as this is one of the most valuable faculties which an architect of mature years can possess, it is only prudent for those in the earlier stages of their career to try to keep their knowledge fresh by setting themselves occasionally imaginary programmes of a sort more ambitious than those which their business at that period is likely to bring them.

OUR readers will remember the case of the enterprising London builder, who set up a private cemetery at Bethnal Green, and after making a good income for many years by the sale of permits to inter bodies in it, finally completed his speculation, after the extension of the city had reached the locality, by cutting up the ground into building lots. A great deal of comment was made on the case by persons interested in sanitary matters, who remembered, among other things, that the bodies of many victims of cholera were buried there, and feared the consequences either of disinterring them or of building houses over them, and, as it seems, one result of the agitation was to deter a builder, who had contracted to erect houses on the land on a building lease, from carrying out his agreement. After the facts had been made public, an Act of Parliament was passed, forbidding the construction of any building on a disused burial-ground, and the contractor was thus cut off entirely from fulfilling his promise. The owner of the land, however, professing to believe that this did not affect his right to claim rent for the land, brought suit not long ago to recover about two years' arrears of the ground-rent specified in the contract. In point of law there would be, perhaps, a question whether the neglect of the builder for a year and a half to do what he had promised to do, and might at that time have done, did not give the owner some claim to be reimbursed for the loss which he had suffered through the failure of the other party to the contract to do what he had agreed, before he was prevented from doing so by the Act; but the judge, with that airy wisdom so characteristic of English magistrates, disposed of this argument in a moment, announcing that in his opinion the contract between the owner and the builder involved a violation of the rights of those who had paid money on the faith that their friends and relations should lie in this ground undisturbed; and although there was no evidence whatever that anybody had paid any money on this faith, he proceeded to infer from his supposition that the contract in question "amounted to a conspiracy," and was, therefore, illegal. On this ground, therefore, he rendered judgment for the defendant. The question as to who should pay the costs was disposed of by a process of reasoning about as admirable as the preceding one, his lordship remarking that "there were no merits in the case, and it was an unholy proceeding altogether," and ordering accordingly that each party should pay his own costs.

THE *Builder* quotes from a book by Colonel Parnell, who has recently made himself conspicuous in discussions on the effects of lightning, a table compiled from the recorded observations of the last one hundred and fifty years, showing the kinds of material most likely to be affected by a lightning stroke, and indicating in this way the character of the action of lightning. Colonel Parnell's opinion is that lightning, far from being a stream of fire descending from the sky, is, as he says, an electric explosion, resembling that of a torpedo, and acting in the majority of cases upward, from the ground to the clouds. The action of the stroke is primarily mechanical, and in most cases nothing but mechanical effects are observed, although a part of the force may be converted into heat, just as happens occasionally with any other sort of motion. The table given in the book certainly confirms these views. It is found, for instance, that the material most frequently disturbed by lightning is stone, in the form of rock or of masonry. We are apt to suppose that trees are the most common object of the attack of lightning, but it appears that rocks or stone walls are affected six times as frequently as trees, and, in fact, trees suffer one-half as often as animals or men. When trees are struck, the effect upon them is in about fourteen cases out of fifteen to split or tear them, without burning them at all. In the fifteenth instance the wood is scorched. When men or animals are struck, on the contrary, indications of burning are observed in about three-fifths of the cases. Stone walls or ledges show signs of burning or melting only once in every two hundred cases. Metal is melted much more frequently, this effect being produced almost as often as the purely mechanical effects of breaking or bending. Gunpowder is usually exploded when struck, but this is probably a mechanical rather than a chemical effect, since any sharp shock, as a blow with a hammer, for instance, may have the same result. Gas, however, is also ignited by lightning, either directly, or, more probably as a consequence of the heating of some imperfectly-conducting substance in contact with the gas. It is singular that the bare ground is disturbed by lightning almost as often as trees. We have heard of a lightning stroke which ploughed up nearly an acre of ground in an instant; and it seems that some such mechanical effect as this upon the soil often accompanies thunder-storms.

LE GENIE CIVIL gives an illustrated account of the new Parson steam-engine, or "steam-turbine," as it is called. Strictly speaking, it has no right to this name, since the action of the steam in it is totally different from that of water upon a turbine wheel, but the fact that all the working parts revolve together inside a stationary casing gives its movement a distant resemblance to that of a horizontal water-wheel. Independent of its name, however, it is a very interesting machine. Perhaps the most accurate way of describing it would be to call it an oscillating engine with four cylinders, fixed on the inside of a pivoted drum-like case, and so connected as to cause the drum which carries them to revolve about the shaft by the movement of the pistons. The transformation of the reciprocal motion of the pistons into a smooth rotary movement of the cylinders is effected by an ingenious application of the geometrical theorem that the line described by any point on the circumference of a circle rolling on the inside of the circumference of a circle of a diameter twice as great, is a straight line, coinciding with a diameter of the larger circle; and that a second point on the circumference of the small circle, directly opposite the first, will in rolling describe a diameter of the large circle at right angles with that described by the first. Reversing these conditions, if any number of opposite and alternating forces are applied at opposite points on the circumference of a disk or shaft free to turn, but not to move laterally, their combined action, which, if the absolute direction of the forces were fixed, would result in nothing but cross strains on the shaft, may, by allowing the absolute direction of the forces to change in one plane, that is, by making the cylinders free to revolve, be so modified as to cause the shaft to move with a rolling motion upon the inside of a real or imaginary circumference of twice its own diameter, while the cylinders revolve with a uniform circular movement around a centre which is also the centre of the circle within which the shaft rolls. In practice, the pistons of the four cylinders used are simply applied to a crank, so designed that the diameter of the circumference described by its outside line is twice its own diameter; and as the small circles must turn twice in rolling once around the large one, the cylinders in the engine revolve for every two trips of the pistons. Such applications of pure geometry to practical mechanism do not always prove so successful as the theory promises, but in this instance the crank and pistons seem to follow the courses marked out for them by mathematics with the utmost docility, and the engine can be run at a speed far surpassing that of any other now in use; one now on exhibition in London giving without difficulty twelve thousand revolutions of the shaft per minute, or about ten times as many as the swiftest engines hitherto made have attempted to furnish. This frightful rapidity of movement may be better appreciated by considering that a locomotive with eight-foot driving wheels, running with this speed of shaft, would go from New York to San Francisco in about an hour. Of course, no locomotive could endure such a strain upon it, and the Parson engine has so far been employed chiefly for driving dynamo-electric machines, which are attached directly to the shaft, without belts or gearing to multiply the speed. During the construction of the Suakin-Berber railway, which was built mostly at night to avoid the heat of the sun, these machines were used for furnishing electric-light. An engine, with its boiler and dynamo-machine, was set upon a platform car, which carried also portable tripods, thirty feet high, at the top of each of which was placed a Brush electric lamp. The tripods, which were made to shut up like a telescope, were set up about a hundred feet apart, and connected by wires with the dynamo, which could be shifted to any position desired.

ARCHITECTURAL TERRA-COTTA. — II.



Window (œil de bœf) in Hôtel at Blois France (Clyse of XII Cen.)

IF you should visit Perth Amboy, in New Jersey, you would find that pleasant old town picturesquely located on the banks of the Kill-von-Kull, and by following a wagon-load of the buff, or of the rich red clay, after the material is mined from the pits, you would be carried into one of the largest terra-cotta manufactories in the United States. The buildings constituting the factory are very numerous, their upper stories being connected by means of bridges and the whole terminating in a dock, where the finished articles are finally carried for shipment to the various portions of the States.

Piercing the roofs of some of the buildings, and towering for great distances above them, are the tops of enormous terra-cotta kilns, which, when you come to examine them within, have the appearance of tremendous brick bottles, securely bound every few feet in height with great encircling bands of iron. The loads of clay are thrown out and spread over large floors in order to deprive it of its moisture, and after being properly dried, the clay is next conveyed by elevators or otherwise to the pulverizing machine, where it is thoroughly disintegrated. After being thus treated, the clay is next mixed with powdered old terra-cotta, or with ground flint, sand or other vitrifiable substances. The clay, after being properly prepared and mixed, next passes into a machine called a "pug-mill," and into this machine there passes a stream of water sufficient to "pug" the clay, or in other words to impart to the material the desired degree of plasticity, and the operation is materially assisted by the arms or knives attached to the shaft of the pug-mill which cut the clay in every direction and thoroughly mix it, and finally, when the material issues from the bottom of the pug-mill, it possesses the desired consistency or "temper." The clay, after being pugged and slightly dried, is next cut into masses and conveyed into the workshop of the moulder or the studio of the modeller. When single pieces are ordered, the modeller produces his design in clay, which is afterward carefully dried and then fired. If more than one are wanted, as in the case of friezes, strings, tiles, simple cornices and capitals, or other ornaments which run through a large space, or are often repeated upon a building, moulds of the object are taken in plaster, and one of the most interesting spectacles to the visitor to the terra-cotta works is the department where these moulds are made, an operation which requires considerable skill and dexterity. The plaster-of-Paris is usually mixed in a mill similar to a pug-mill, used for tempering the clay, and as the plaster rapidly hardens, and at the same time shrinks so much during the hardening process that a large mould requires to be made in different sections, and, in cases of intricate design, in a great many pieces.

Numerous men and boys flit about the department, swiftly performing the requisite manipulations as they pour the fluid plaster-of-Paris into forms or into moulds which stiffen while they are smoothing it into shape. In cases of designs which have under-cut ornaments the highest skill and experience are requisite, and in such cases, on account of the rapid deterioration of the moulds, it is possible only to obtain a few casts, and such designs are usually cast first in gelatine, which is readily withdrawn from the under-cut portions of the mould, and upon being released readily resumes its proper form, and in this way the moulds are reproduced and kept uniform. By means of the ordinary plaster moulds, the more common ornaments can be indefinitely reproduced, and in cases of continuous moulding it is not an uncommon practice to shape the moulding by passing it, or, rather, expressing it, from a machine constructed similar to an ordinary expressing brick and tile machine. In case the designs are produced by the latter method, a die of the proper shape is attached to the mouth of the machine, and as the tempered clay is forced through it the moulding is performed. In this way crown mouldings for cornices, etc., are cheaply produced of the desired form and thickness, and are afterward divided by wires into the necessary lengths. When the plaster moulds are employed the clay is pressed with the hand into the mould and the objects are afterward finished with the fingers, care being observed to have the object of uniform thickness throughout, otherwise "warping" or twisting from the heat not reaching all the materials equally and simultaneously will be the certain result. For example, when a mould is employed, the clay is not forced into it *en masse*, but the plastic material is deftly pressed only against the sides, the moulder following the varying surfaces of the mould and leaving, as nearly as possible, a uniform thickness of clay in the various parts, and if the design is of such a character that it would not, in its hollow form of undried and unburned clay, retain its shape unimpaired until fired, then braces or "struts" of clay are formed in the interior so as to sustain the design until it passes through the kiln, and also to add increased strength after being burned. The thickness of the clay of course varies with the nature and different purposes for which the objects of terra-cotta are to be employed; but the average thickness is about seven-eighths of an inch; this, however, is exceeded where strength is a requisite.

A uniform thickness of the material is an imperative necessity in all classes of terra-cotta, whether it is to be used for ornamental purposes or simply as building-blocks, this requisite being more readily attainable in the latter case than in the former, as the blocks are simply hollow pieces of terra-cotta, having walls of equal thickness. There is no question of the reliability of the material, even in a hollow form, for sustaining great weight; but in some cases the blocks are required to be placed in such positions that the hollow portions require to be filled with cement or with cement concrete, and in such cases a material should be employed which will not swell in drying. In order to prevent the bursting of the filled pieces, fat cement, so delusive to many, should not be employed, it being much better to use clean sand and a minimum proportion of cement.

Many of the ornaments reproduced from plaster moulds are very pleasing, but the real beauty of terra-cotta lies in the ease with which the plastic material lends itself to the skill of the modeller, who can impart to it his grandest and broadest conceptions, and then have them transformed into a material which is more imperishable than granite; but to do this successfully, the modeller must possess dignity and great sweep of imagination. He must love his work and be absorbed in it, and habituated to executing his ideas in a manner bold and free, or otherwise his productions will be a failure, as the design must necessarily be viewed from a distance, and show a symmetry of proportion entirely unattainable by one who dissipates his force by attention chiefly to minute details; but the grace and harmony of separate proportions should be preserved in that of the finished whole. Different subjects, of course, require different treatment, but if the design be a panel in high relief it should show spirited modelling; and if the subject is foliage, the curves in the leaves should give good shadow; but whatever may be the object, the result should show genuine artistic skill. The importance of sufficient time being allowed for making moulds, models, and drying the moulded or modelled pieces cannot be over-estimated, and there should be less of that too frequent hurry now so common in the execution of orders. The pieces should be dried just sufficiently to give them the right texture, for if they are too damp or "green" they will crack or be crushed during the firing; should they be too dry, they will crack even during drying, and should there be a great variation in the different portions of an article in regard to thickness, or in proportion of moisture, it is extremely liable to be distorted by twisting, owing to unequal contraction, both during drying and while in the kiln. The objects after being removed from the plaster moulds are finished by hand, and should the workman leave portions of the surface unevenly finished, or one part less smooth than the remainder, which not infrequently results from some partial tooling arising from an after-thought after the article is partially dried, the difference in the texture of the surface will prove another source of danger while the article is in the kiln, as it would be very liable to distortion because of the moisture contained in the clay being drawn from the smoother portions and dispelled through the more porous, thereby causing the former to contract. The system of piece-work, which is generally adopted in English and by some American terra-cotta works, is an unmitigated evil, and is not infrequently the cause of much of the cracking, distortion, twisting, warping, or the irregularities which have come to be commonly regarded as inevitable.

There is, of course, good terra-cotta, as well as lower grades of the same material; but architects often have only themselves to blame for the inferior quality of this material, which not infrequently finds its way into buildings, because they allow the control of this branch of the work oftentimes to pass into the hands of irresponsible contractors, who have no interest in the matter beyond the profit which they can make by placing the order. If architects would treat directly with manufacturers of terra-cotta, and give them a reasonable time in which to execute their designs, there would be less complaint on the scores which have been mentioned, and valuable time would in many instances be saved. When the execution of the designs in terra cotta are entrusted to the general contractor, he will naturally seek to have the work executed as cheaply as possible, and as all the better manufacturers of this class of material compete on almost equal terms, the probabilities are that the execution of the architect's designs will in the end fall into the hands of manufacturers who do not possess sufficient facilities and are not over particular in regard to the work which they turn out, or the promises which they make.

There are stones of good quality and others of poor quality, and there are some which are soft and others which are hard, and with terra-cotta it is just the same; some being bad in color, bad in texture, and bad in every other respect, and such material is produced from clay which is wholly unsuitable for the purpose, as the shrinkage

Continued from page 268, No. 491.

is uneven and excessive, consequently requiring an undue proportion of "grog" to be mixed with it during the pugging, and which is intended in some degree to obviate the imperfections of the clay, but the common result is that the color, if it be red, is oftentimes completely ruined. In order to give the surface the desired red color, the moulded or modelled terra-cotta, after being dried, is washed over or dipped into a "slip" of clay containing oxide of iron, and after being burned, the object thus treated presents for a short time a good appearance; but after a time, as the wash can never be made to permanently adhere to the terra-cotta body, owing to alternate frost and thaw, atmospheric and other changes, it finally falls off and discloses an undesirable, mottle-colored surface, which permanently disfigures the structure. It may be said in this connection, by some persons, that they can not see any additional reason why the architect should control and hold in his own hands the execution of his designs in terra-cotta, than for any of the other materials which enter into the construction of a building; but, as the architect will be held more rigidly responsible for any failure, artistic or otherwise, in the terra-cotta than in the ordinary materials, we can see no good reason why he should allow it to be executed through the general contractor any more than he would allow the frescoing or other fine decorative features of a building to be performed by that individual.

There are, of course, delays in supplying all materials for a building which require to be produced upon special order, and this is especially true in regard to those which have to be subjected to the action of fire, as there must necessarily result a certain percentage of loss, and it is this which oftentimes causes the annoying delays in supplying terra-cotta. The question naturally arises, how are such delays to be obviated? Undoubtedly the proper way is for an architect, when his client and himself have decided that terra-cotta shall be used in the structure, and the plans and specifications have been fully agreed upon, is to immediately prepare the working details of his designs, and forward them to the manufacturer whom he may select for their execution, and while tenders are being received for the work of constructing the building, and while the excavation is being made, the terra-cotta manufacturer can be turning out his work, so that when the builder is in readiness for the first consignment, it is more than probable that the terra-cotta manufacturer will have the major portion of the work accomplished, and in such cases there would be no procrastination. The delays in receiving terra-cotta, because of which so many complaints arise, are caused in almost every case, by a block — usually some very important constructional one in the building — being destroyed either in the drying or burning, and if the manufacturer could obtain a sufficient lead of the contractor, he would have an opportunity to replace such a block by another, before it would be required in the work. It is, however, not only because of the delays, but also on account of quality, that time is so important to the manufacturer of terra-cotta; for in nine cases out of ten, it is when the work requires to be unduly hurried through the moulding or modelling and the drying and firing, in order to keep the building "going," that the defects of cracking, twisting and warping take place. If this material is properly treated, and allowed sufficient time, it will issue from the kiln as true and as beautiful as if it were carved from stone with the chisel and the mallet.

Manufacturers are sometimes delayed in getting out terra-cotta work by the manner in which the working-drawings are prepared, as few architectural draughtsmen possess the necessary extensive experience requisite to properly prepare such drawings. The form of the pieces, as well as their size, require to be taken into consideration: the manner in which they are bonded and keyed, the joints, etc.

I have dwelt thus long upon the delays which are liable to occur in the execution of architectural designs in terra-cotta, and the manner in which they can be avoided, for the reason that such delays or the apprehension that they will occur often militate seriously against the employment of the material.

After the pieces have been carefully and thoroughly dried, they are carried to the kiln, in which they are skilfully set, the smaller pieces being packed in "seggars," and in delicate pieces of terra-cotta relief work, in order to preserve the sharpness and definition of texture, they are sometimes packed in a less fusible powder, like quartz grain or canister. The entrances to the kilns, after they are filled, are finally walled up with brick, and daubed or plastered over with clay, and fires are then lighted in the furnaces underneath. The kiln used is an up-draught kiln, so constructed that the fire does not come into contact with the object to be burned, the flame passing from the gates, at the base of the kiln, through a pipe set up in the centre. The objects are placed in the kiln in tiers, separated by fire-brick, the larger pieces being placed in the topmost portions of the kiln, and the time and method of burning are about the same as in the case of fire-brick.

When terra-cotta has been improperly fired, there is constant danger that it will rapidly disintegrate after a short season of exposure, owing to the fact that it failed to receive sufficient heat to impart to the perishable clay the chemical change upon which its indestructible character depends. The simplest tests are usually sufficient to distinguish inferior terra-cotta from that of good quality, for a well-burned and enduring material will emit a sharp, metallic, ringing, bell-like sound, when forcibly struck with a piece of steel, which will cause a spark to be emitted; but such a blow will not dent or disfigure the terra-cotta, the only visible mark being such as would be made by a black lead-pencil.

The advantages of this material are its superiority and its cheapness, consequently allowing greater ornamentation to be used in the construction of a building. These advantages become at once manifest, if we recall what a tiresome and expensive piece of work it is to carve a long piece of repeated design in stone, and how comparatively cheap and easy it is to make an elegant, delicate model almost as clear-cut as a cameo, in soft clay or on a plaster-of-Paris slab, take a mould from it, and reproduce from twenty-five to fifty pieces, or as many as may be required, in fact, by simple mechanical labor. How much must an artist lose by conveying his ideas through mallet and chisel, while with a touch of his finger he imparts to the soft, yielding clay the impression of his soul, which, on being properly dried and burned, will last forever. It is an interesting sight to stand in the studios of a modern terra-cotta factory, and witness the work of the artists in this material, who, alert with keen intelligence, stand before large easels supporting masses of clay, carving the bas-reliefs from sketches hanging above them, and many of them seem to truly love their work.

While stone and all other natural productions used for building crumble away by the action of the weather, or crack and twist into all kinds of conceivable shapes under the influence of fire, terra-cotta never changes, and presents the only lasting triumph of man over nature; the material being absolutely indestructible, excepting through sheer wantonness.

Architects are now coming to the conclusion that in the construction of fire-proof buildings there should be employed just as little iron, stone, wood and galvanized-iron as possible, substituting terra-cotta wherever possible, in the place of each of them.

Charles T. Davis.

TALL CHIMNEY CONSTRUCTION.[1] — II.

ST. ROLLOX CHEMICAL WORKS CHIMNEY, GLASGOW.

Ancient Christian Lamp. From the Vatican.

Messrs. Charles Tenant & Co.'s chimney, projected by the late W. J. Macquorn Rankine, C.B., LL.D., designed by L. D. B. Gordon, and built by the late Mr. McIntyre, ranks second in height, being in

	ft.	in.
Height from foundation to top	455	6
" " ground surface to top	436	6
Outside diameter at foundation	50	0
" " ground surface	40	0
" " top	13	6

It has an inner cone of the following dimensions: —

	ft.	in.
Height of inner cone from foundation to top	263	0
Height of inner cone from ground surface to top	243	0
Inner cone inside diameter at foundation	12	0
Inner cone inside diameter at top	13	6

The use of the inner cone is to protect the principal stalk from various kinds of gases.

No piles were driven in the foundation, it being founded on a bed of concrete fifteen feet thick on the top of the rock, the upper surface of the concrete, the better to resist any downward pressure, being finished at right angles to the line of the principal shaft, which inclines inwards for a considerable height.

The outline of the chimney, it may be said, is taken from the Eddystone Lighthouse, or the natural form which a chain would assume in being stretched from a height to a point on the ground beyond that of its upper end.

The late Mr. Peter Wilson, C.E., resident on the Highland Railway, was entrusted by the designer of the chimney to superintend the erection of this important shaft.

The highest chimney-stack in England is the

LARGE CHIMNEY-STACK OF MESSRS. DOBSON & BARLOW, KAY STREET MACHINE-WORKS, BOLTON, LANCASHIRE.

The large chimney-stack connected with seven boilers, ventilating-flues, furnaces, etc., at these works was completed in November, 1842, and was then intended to serve a chemical-works. Shortly after, the ground occupied by the chemical-works was included in Messrs. Dobson & Barlow's works, and consequently the chimney came into their possession.

The following are some principal particulars: —

Total height from ground level, three hundred and sixty-seven feet, six inches.

Octagonal in plan, fourteen feet on every side, or one hundred and twelve feet girth at bottom.

Thickness of brickwork at bottom, eight feet.

Thickness of brickwork at top, one foot, six inches.

Five feet, six inches on every side, or forty-four feet girth at top.

Eight hundred thousand bricks and one hundred and twenty tons of stone-work were consumed in the building. The top with cornices and mouldings required thirty tons of stone and cement.

---

[1] A paper by R. M. Bancroft and F. J. Bancroft, read before the Civil and Mechanical Engineers' Society. Continued from No. 493, page 269.

EDINBURGH GAS-WORKS CHIMNEY.

	ft.	in.	
This chimney is	341	6	from foundation to top.
"	329	0	" ground "
Stone foundation	40	6	square, and 6½ ft. deep.
" pedestal	71	0	high.
Stone pedestal	30	0	square at ground line.
" "	27	9	" top.
Brick shaft	264	0	high.
" "	26	3	diameter at bottom.
" "	15	0	" top.

The main brick shaft is diminished in five steps of the following successive heights:—

	ft.	in.
1st bottom portion	35	by 35
2d portion	41	" 30
3d "	48	" 25
4th "	58	" 20
5th "	84	" 15

An inner chimney of brickwork ninety feet high by thirteen feet.

The next chimney that I shall notice is the one at Barmen — the interest attaching to this is another example of straightening when out of perpendicular.

MESSRS. WESENFIELD & CO.'S CHIMNEY, CHEMICAL FACTORY, BARMEN, PRUSSIA.

This chimney is 345 ft. from foundation to top.
" " 331 " " ground "

The foundation was made of large flat quarry stones with terrace mortar: One lime, one river sand, one terrace, which latter is a kind of puzzolana.

Twenty feet square pedestal, by forty feet high by seven bricks thick.

Octagonal shaft two hundred and ninety-one feet high.

Octagonal shaft, exterior diameter seventeen feet at base by five bricks thick; this diameter is reduced two-and-one-half inches every ten feet, so that at top of shaft it is two bricks thick.

According to the original design, it was intended to only build it two hundred and sixty feet high, but as the building was proceeding in a very satisfactory manner, it was considered safe to increase the height without altering the dimensions of the base; and it has been calculated that in the lowest part of the shaft the brickwork sustained a pressure of twenty-one thousand three hundred and thirty-five pounds per square foot, or one hundred and forty-eight pounds per square inch.

The interest attaching to the chimney is that a few months after completion it got out of the straight, and had to be put right in a similar manner to the "Port Dundas" chimney, described at the beginning of my paper.

The chimney was built with great care, the mortar being prepared every morning — the proportions used for the pedestal being one lime to two of river sand.

Cement mortar was used on rainy days, mixed in the proportions of one cement to two of river sand, and the crown of the chimney of cement exclusively. The joints of the brickwork were flushed up with cement.

The three masons who did the whole work daily changed their positions on the chimney, so as to equalize any unevenness in the masonry that might be caused by imperceptible differences in the manipulations of the different individuals. At distances of fifty feet, single layers of brickwork were painted black outside, to afterward facilitate an estimate of the height of any point of the chimney above ground. The chimney was built from the outside without a scaffold, the materials being hoisted by a steam-engine put up temporarily near the place of construction. The motion was transmitted by three rollers or drums. The frame which supported the upper drum was moved higher up after the completion of every three or four layers of brick, and was, at the same time, turned horizontally from one side of the octagon to the next one, to equalize the effect of the pressure of the frame on the masonry. The holes made into the masonry to support the frame were filled up with brick and mortar immediately after the removal of the frame to a higher level. The construction of the chimney was thus successfully completed in October, 1867, was perfectly vertical, and answered the requirements for which it was erected. But in the spring of 1868, remarkable for vehement and long-continued gales and storms, this chimney suddenly assumed an inclined position toward the northeast. The injurious action of the southwest wind was probably favored by the bold proportions of the structure, by the yet subsisting softness of the mortar, and by the large size and the shape of the ornamented chimney crown. This crown caught the wind, and thereby caused it to act as on a long lever. The chimney was thus bent, and the mortar not being perfectly dry the brickwork did not yet possess the necessary elasticity to return to its original shape.

The deflection of the chimney was considered at the end of May, and seemed yet to increase, and threatened an overthrow.

As before mentioned, some layers of bricks in the chimney at distances of fifty feet from each other were painted black outside. The height of these black lines above the pedestal being known, these lines were, by means of a theodolite, projected on a plank situated on the pedestal of the chimney, to find the deviation from the vertical line at these different heights. It was thus ascertained that the chimney, at a height of

251 ft. was out of line 45 in.
210 " " " 30 "
160 " " " 16 "
110 " " " 5 "

The pedestal stood perpendicular. As the deviation was still increasing, and as it would have done too serious an injury to the manufacture of the establishment to set the chimney temporarily out of use, it was necessary that immediate action should be taken in the matter. The ordinary method of straightening chimneys was at first resorted to. A hole was made through the whole thickness of the masonry on that side of the chimney which required lowering, at a distance of four feet above the top of the pedestal. Into this hole a saw was introduced with which a horizontal cut through one-half the chimney was attempted. But as the thickness of the wall was considerable and the bricks hard, and as the saw could be manipulated from one of its extremities only, the effect of sawing after two hours' work was scarcely perceptible.

A hole through the chimney having been made without trouble, the difficulty experienced in sawing led to the idea to gradually remove a whole layer of bricks, replacing it by a thinner layer, thus to produce the desired slit. Before, however, this operation was performed, the experiment was made with an old inclined chimney, one hundred and twenty feet high. When the method had there proved practicable and successful, it was concluded to treat the new chimney in the same way.

A layer of bricks was broken out by means of pointed cast-steel bars from one-and-a-half to five feet in length.

Purposely-made flat shovels, with long handles, were used to lay those bricks which had to be placed near the inside of the chimney. A space of five inches was left each time between the newly-laid bricks and the old ones of the next division, to break out the latter with greater facility.

The width of each single division was two feet to two-and-a-half feet. The masonry was sufficiently dry above not to give way when a layer of that width was removed below it.

The act of settling by oscillations lasted from eighteen to thirty-six hours, corresponding to the width of the slit, which was different in the different cuts performed, in a similar way at different heights of the same chimney. The oscillations were the greater and the livelier, the higher up the cut was which produced them.

At the highest cut, one hundred feet from the top, the oscillations were such that the mason became frightened and left the place; the slit became alternately wider and narrower by three-fourths of an inch. The facts before mentioned seem to prove the elasticity of the whole structure. Four cuts were made into this chimney; the

1st	4	feet	above	the	pedestal,	greatest width ⅜
2d	100	"	"	"	"	" 1¼
3d	140	"	"	"	"	" 1½
4th	191	"	"	"	"	" 1

After the completion of these operations, the chimney continued during several weeks to settle slightly in the direction opposite to its former inclination, the brickwork on that side being now subjected to a higher pressure than before.

This circumstance had to be carefully considered beforehand, or else the slits would be made too wide, and produce an inclination of the chimney in an opposite direction. A severe storm which occurred on the 6th and 7th of December, 1868, and which threw over several chimneys in the neighborhood, did not affect the above. The result of the straightening operation before described is perfectly satisfactory, and the structure is now stronger and steadier than ever.

I have yet to speak of the means by which the upper parts of the chimney were made accessible to perform the upper cuts. This was done on a new and interesting plan. Standing on the lowest platform, the masons made a number of holes all on the same level, four feet above the platform, into the exterior wall of the chimney. They stuck iron bars into these holes, and fixed boards to them, so as to form another platform. Standing then on the latter, they made another one four feet higher up in the same way, and so forth. Every second platform was again removed, so that the remaining platforms were eight feet apart.

They were then joined by ladders to make the ascent possible and easy. This method is, however, only practicable when the chimney has a considerable diameter, and when the mortar is sufficiently dry not to give way under the one-sided pressure of the bars and platforms which would make the arrangement loose and unsafe.

In December, 1868, another chimney at Duisburg was straightened by the method above described. But as the diameter of the chimney was not as large as that of the Barmen chimney, and as the mortar was yet soft, a wooden scaffold was erected around the chimney, to get at the upper points which required cutting. The breaking out and replacing of the bricks could not be done there in divisions wider than five to ten inches, otherwise the upper masonry, not being dry, would have settled down. When the chimney was straight, a further settling towards the side of the cut was prevented, by driving iron wedges covered with mortar into the slit.

It is needless to add that great care must be used in the method of straightening chimneys here described, for without precaution it may end in a fatal manner, as recorded farther on in a case at Oldham, where, owing to the reckless manner in which it was done, one man lost his life.

Mr. Edwin Nash, in a paper referred to before, cites two other cases of straightening chimneys. There is one near the canal, between London and New Cross, which leaned over soon after it was built, but was brought back to the perpendicular by boring holes in the mortar joints near the base on the contrary side to the lean, and being done with much caution. A large one, in Yorkshire, which had a very great lean and was likely to fall, had part of a course of bricks cut out from the bottom, slowly and carefully, and filling in the cavity as the operation went on with new lime and earth, and when the cut was complete the chimney gradually assumed its perpendicular, squeezing out the lime and earth as it came over.

MESSRS. EDWARD BROOKS & SONS' CHIMNEY, FIRE-CLAY WORKS, HUDDERSFIELD.

The shaft is built entirely of fire-clay.
It is 330 feet high from foundation to top.
315 " " ground "
Concrete foundation.
Ragstone footings 36 feet square at base.
" " 31 " ground.
Brick shaft 27 feet outside diameter at ground.
" " 15 " inside " ground.
" " 12 " outside " top.
" " 9 " inside " top.
The chimney contains the following weights: —
144 cubic yards concrete.
2452 " feet ragstone footings.
3341 " feet ashlar.
2227 " yards brickwork.

The cap being so large, and overhanging so much, has cost the firm at least £700. In the first instance the covering blew down; it was entirely removed and covered flat with lead, which also blew off, and all had to be taken down. Then the action of the acids emitted from the chimney decayed the stone; one of the overlapping stones fell off; Messrs. Brooks then removed all down to E, and rebuilt the top to its original height.

The firm, from their experience, have arrived at the conviction that chimneys should be built with one regular batter from bottom to top, and no stone should be used at top, any overlapping to be gradually formed by hard-burnt radiated fire-bricks fourteen inches by five inches by three inches.

CHIMNEY AT MESSRS. MITCHELL BROTHERS, MANCHESTER ROAD, BRADFORD.

This stone chimney is octagonal.
Height from foundation to top 330 feet
" " ground " 300 feet
Flue perpendicular 7-0 dia.
The foundation consists of
1 course of concrete 22 ft. by 22 ft. by 1 ft.
1 " " 21 ft. by 21 ft. by 1 ft.
The stack itself measures
20 feet across foundation
9 feet at summit.

The architect who designed the shaft was Mr. Mark Brayshaw, and the builders, Messrs. John Moulson and Son.

CIRCULAR CHIMNEY STACK, ADAMS'S SOAP WORKS, SMETHWICK, NEAR BIRMINGHAM.

	ft.	in.
Height from bottom of foundation to top	326	10
Height from ground surface to top . .	312	0
Outside diameter at ground surface . .	27	2
Inside " " " . . .	15	2
Outside " at top	5	6
Inside " "	4	0
Weight of brickwork	2000	tons
Weight of concrete, sand, and lime . .	150	"

This chimney was built in 1835, and at the time of its erection it was the highest in the kingdom. The builder who began the work felt alarmed when about half way through his work, and the firm had to finish it themselves.

It has been five times struck by lightning; once during the building, and four times since. No very serious damage was done to it by the electric fluid, but once, when perhaps, from the same cause, and the abstraction of the lime by hydrochloric acid from the mortar, the owner was compelled to take down a portion of the top. A few years ago, about thirty feet more were removed by a Mr. Frith, builder, of Coventry, by means of a kite, without stopping the works. The total height is now about two hundred and fifty feet.

THE ILLUSTRATIONS.

[*Contributors are requested to send with their drawings full and adequate descriptions of the buildings, including a statement of cost.*]

COMPETITIVE DESIGN FOR THE CHAMBER OF COMMERCE, CINCINNATI, O. MR. BRUCE PRICE, ARCHITECT, NEW YORK, N. Y.

THIS building is designed in the spirit of the French Renaissance of the early sixteenth century, when brick and stone and tile were the materials employed. The design embodies the same materials. The old municipal buildings of that period were carried up with great square towers, high, peaked roofs, and long, tapering dormers like the pinnacles of the ecclesiastical structures that preceded them. Upon the walls were sculptured the arms of the guilds and the triumphs of their champions. These motives entered into the spirit of all their details. Heavy mullioned stone windows, reaching from floor to roof, lit their great halls, and enormous fireplaces, with richly-carved canopies, warmed them. In plan and general requirements these city-halls of Northern France and the Low Countries were in many respects analogous with the requirements of the proposed Chamber of Commerce.

The Great Hall, one hundred feet long by seventy-six feet wide, and fifty feet high, is placed to the rear of the second tier, with great windows on two sides of it. On the front is the lesser hall, with bay-windows commanding the corner at Fourth and Vine Streets. This room opens into the Great Hall through broad, high portals, and is virtually a continuation of it. In it are the files of the reports, newspapers, the tickers and everything pertaining to the contemporary operations of commerce. Directly off both halls is the members' lobby, with the grand staircase leading down to the Fourth-street entrance. In this space, broken with columns and the parapet surrounding the stair-well, members can meet for hurried instruction or hasty conference with their friends and clients, the space being so planned and designed by its peculiar features as to give that sort of lobby accommodation always required in such buildings. Apart from these rooms, on the level of the Great Hall, are others set apart for the use of the Chamber of Commerce, which are arranged upon the half-story levels coming in between the floor and ceiling of the Great Hall. These are: first, a visitor's gallery, arranged over the clerks' room and lavatories, and also the gallery story of the lobby (see sections B and C); second, the entre-sol story just over the gallery, which contains two large rooms on Fourth-street front; third, the mezzanine floor, which is eight feet in the clear, coming between the entre-sol and the first office floor of the building. This floor consumes the space in the balance of this level not occupied by the roof of the Great Hall. The mezzanine floor contains five excellent rooms.

Above the level of Great Hall roof are two full stories, with thirteen fine offices in each, and two additional stories in the tower, with five offices in each. The illustrations exhibit the remaining features of the planning.

In elevation the design rises out of this plan in stone and brick, with tiled roofs. The great entrance on Fourth Street is through triple portals; the central one, leading directly to the grand staircase, is arched. The whole of the great entrance, with the lobby above, is treated under one frontispiece, with carving emblematic of commerce and trade, and the name of the building across the lintel. The tower rises on the corner of Fourth and Vine Streets, girdled at the level of the eaves with a sculptured procession of figures of heroic size, in high relief, typifying the arts, sciences, manufactures, commerce and agriculture. Upon the tower and Fourth-street fronts are arc-lights designed as features of the elevations.

Whilst a general *motif* runs through the entire mass, as in the design of the windows and their enrichment, there are certain distinctive features that claim for the building a pronounced public character; notably the tower and its processional frieze, the treatment of the roofs, the entrances, and the general outline of the whole. In detail, the leading features are designed for special treatment; the entrance lobby, grand staircase and members' lobby are designed for marble wainscot, steps and columns, with trabeated ceilings in stucco and tiled floors. The corridors of ground floor and basement to be the same. The Great Hall to be built of cut-stone to the seat of the girders, with oak wainscot to the height of the doors. The roof of Great Hall to have deep panels between the beams, the meeting of the girders treated like pendant beams, and the walls and ceilings of the panels heavily enriched to give the effect of a deeply-timbered roof. The lesser hall to have a high oak wainscot, carved stone chimney-piece, and a trabeated ceiling.

On the sections of the Great Hall certain designs are shown in the pediments of the arches. Those over the gallery are designed for mosaic, and those over the bays for glass-mosaic, but all to be of subjects bearing upon the arts, commerce, etc. The floors of great and lesser halls to be of oak parquetry. Throughout the building the finish to be in quartered antique oak, and the whole structure to be absolutely fire-proof. As to the cost of such a work, that can only be arrived at by comparing it with buildings of a like character erected throughout the country. The design is in no wise an extravagant one, but will compare in finish and detail with such eight and ten story fire-proof structures as the United Bank Building of New York, which cost between thirty dollars and thirty-three dollars per square foot of surface covered. Basing an estimate upon that and a knowledge of prices in Cincinnati, which are considerably less than building prices in New York, there seems no doubt that the building can be erected for the sum of five hundred thousand dollars.

BOSTON TERRA-COTTA COMPANY'S PREMISES, FEDERAL STREET, BOSTON, MASS. MR. W. G. PRESTON, ARCHITECT, BOSTON, MASS.

THE extraordinary and well-earned success of the Boston Terra-Cotta Company has necessitated the enlargement of the premises occupied by them on Federal Street. They own a very large and valuable frontage and will eventually cover the whole with buildings for their own use. With a view to future developments and growth

COPYRIGHTED, 1885, JAMES R. OSGOOD & CO.

a Portion of
the

BOSTON TERRA-COTTA COMPANY'S
—NEW BUILDING—

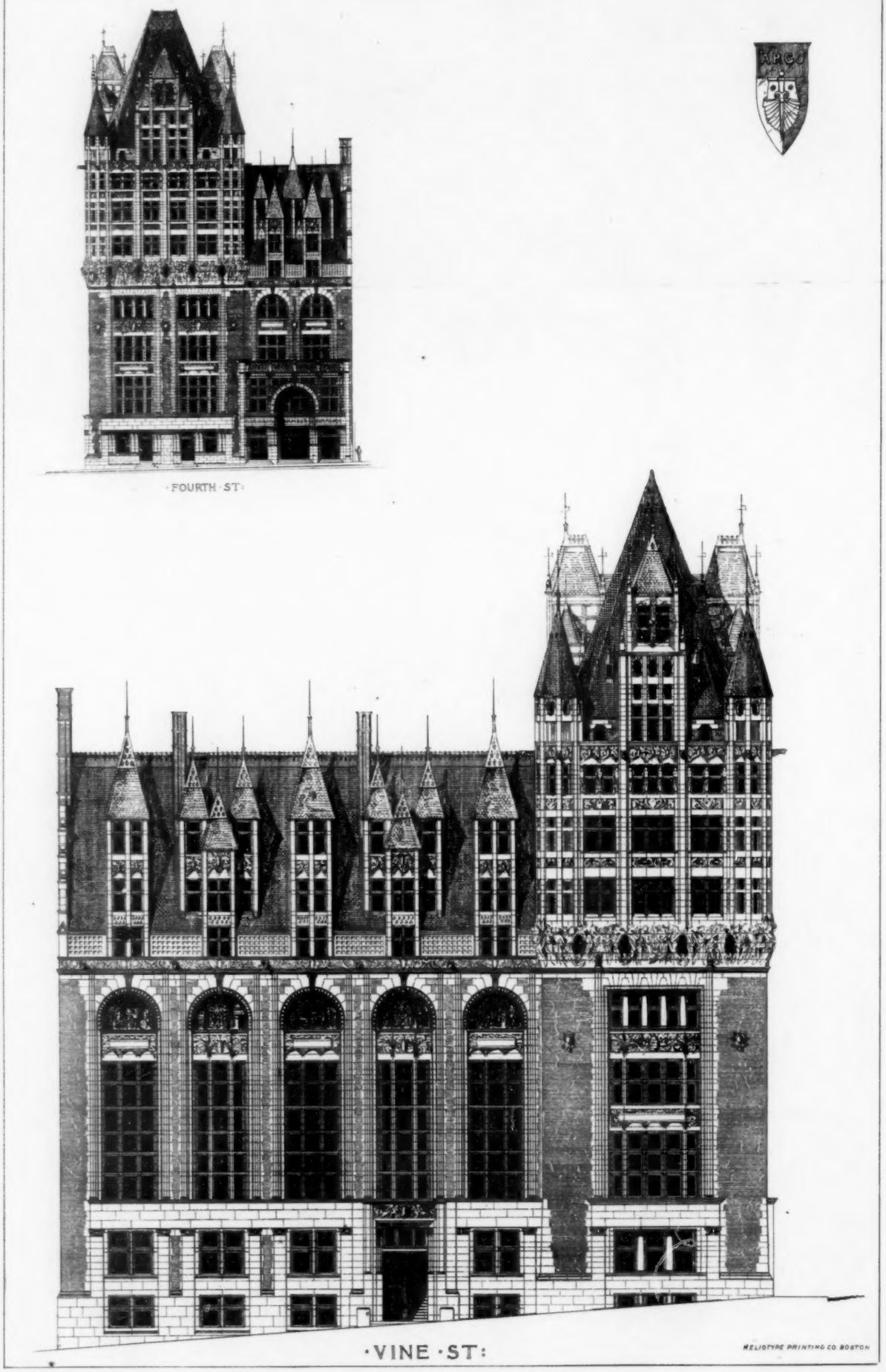
BOSTON

Federal street Elevation
Boston Terra Cotta Co.

Wm. G. Preston, Architect

HELIOTYPE PRINTING CO. BOSTON

COPYRIGHTED, 1885, JAMES R. OSGOOD & CO.



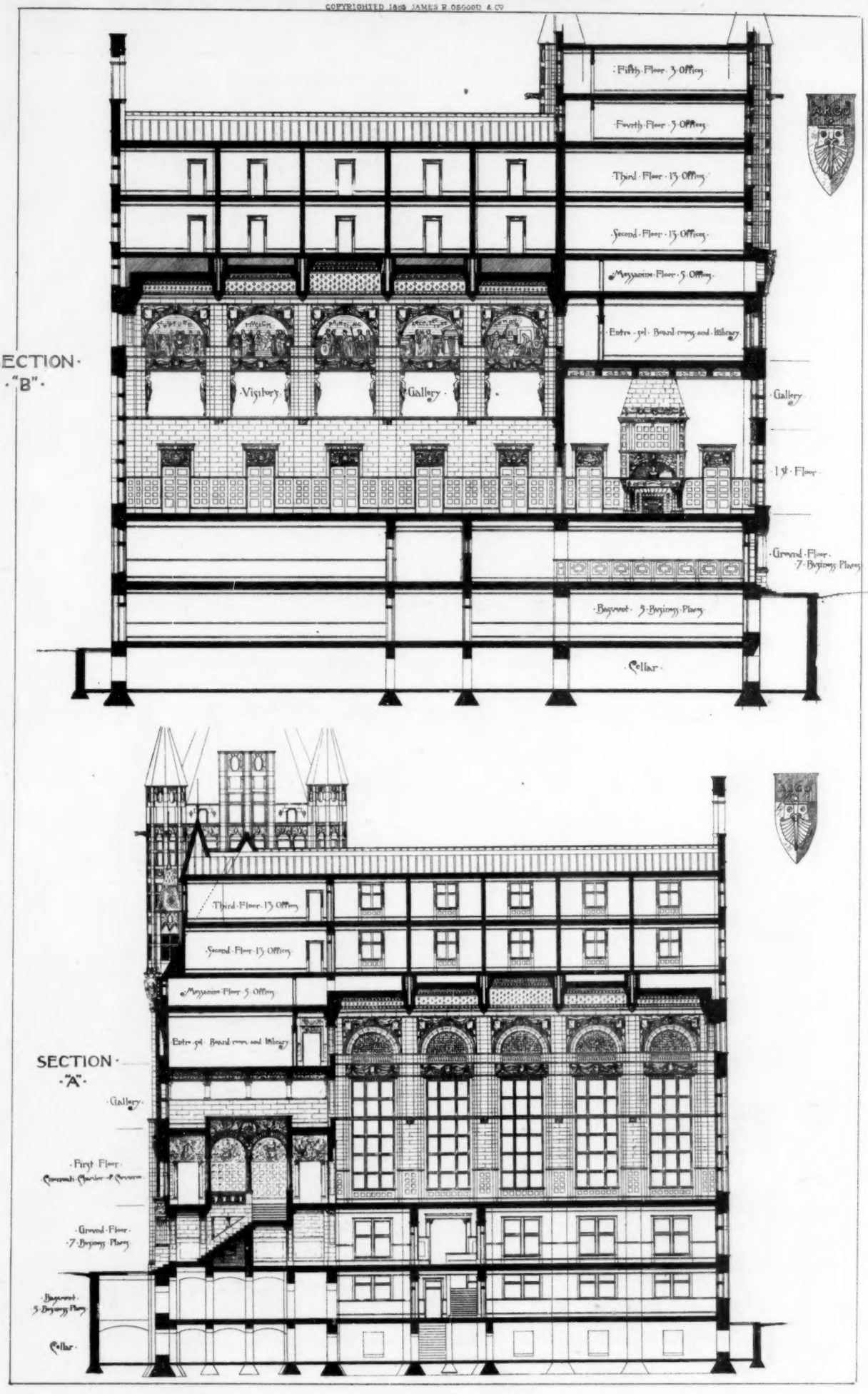
COMPETITIVE DESIGN FOR THE CINCINNATI CHAMBER OF COMMERCE · BRUCE PRICE, ARCHITECT, NEW YORK.

COPYRIGHTED 1885 JAMES R. OSGOOD & CO

COMPETITIVE DESIGN FOR THE CINCINNATI CHAMBER OF COMMERCE · BRUCE PRICE, ARCHITECT, NEW YORK.

HELIOTYPE PRINTING CO. BOSTON

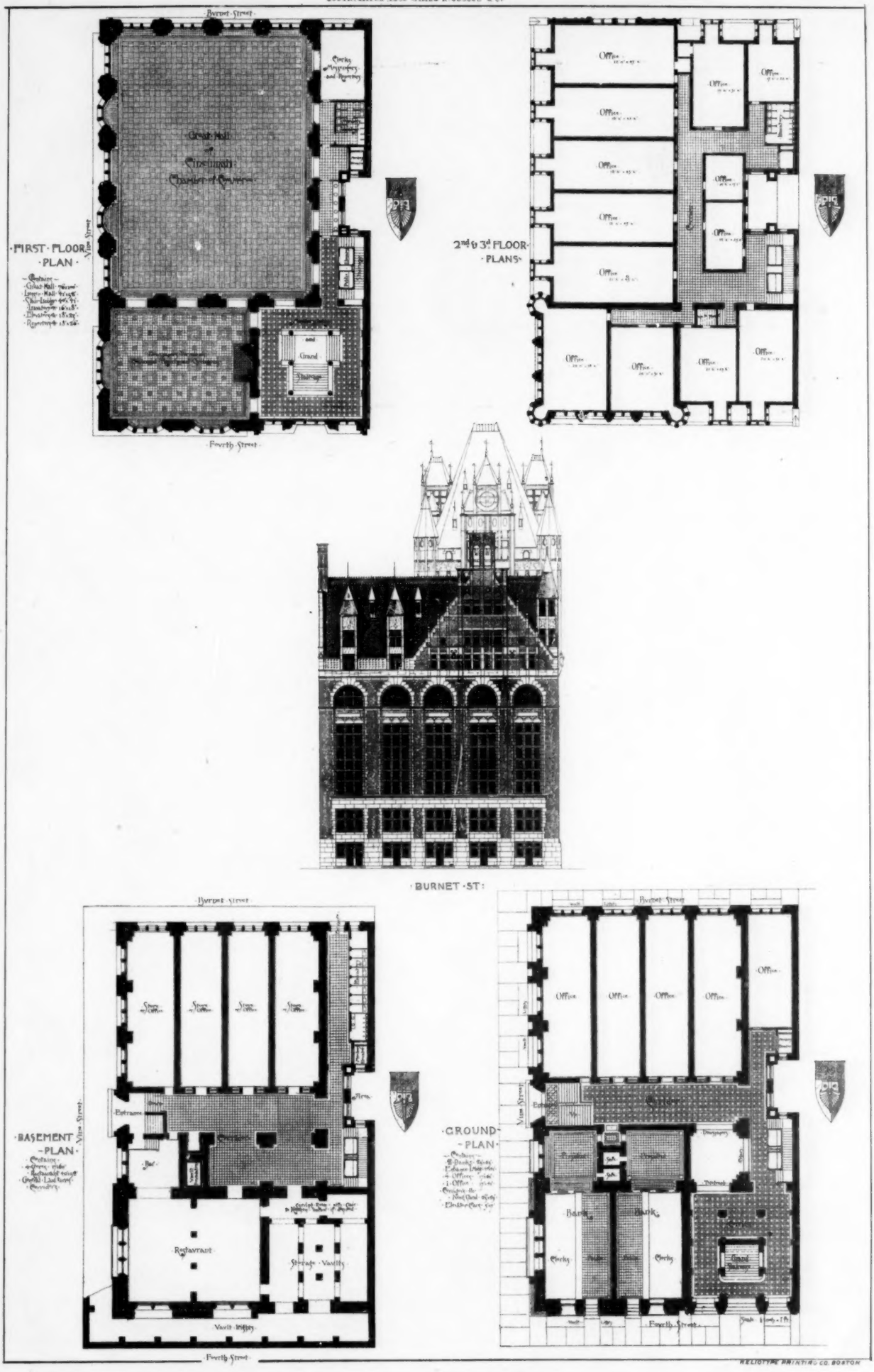
COPYRIGHTED 1885 JAMES R. OSGOOD & CO.



COMPETITIVE DESIGN FOR THE CINCINNATI CHAMBER OF COMMERCE · BRUCE PRICE, ARCHITECT, NEW YORK.

HELIOTYPE PRINTING CO. BOSTON

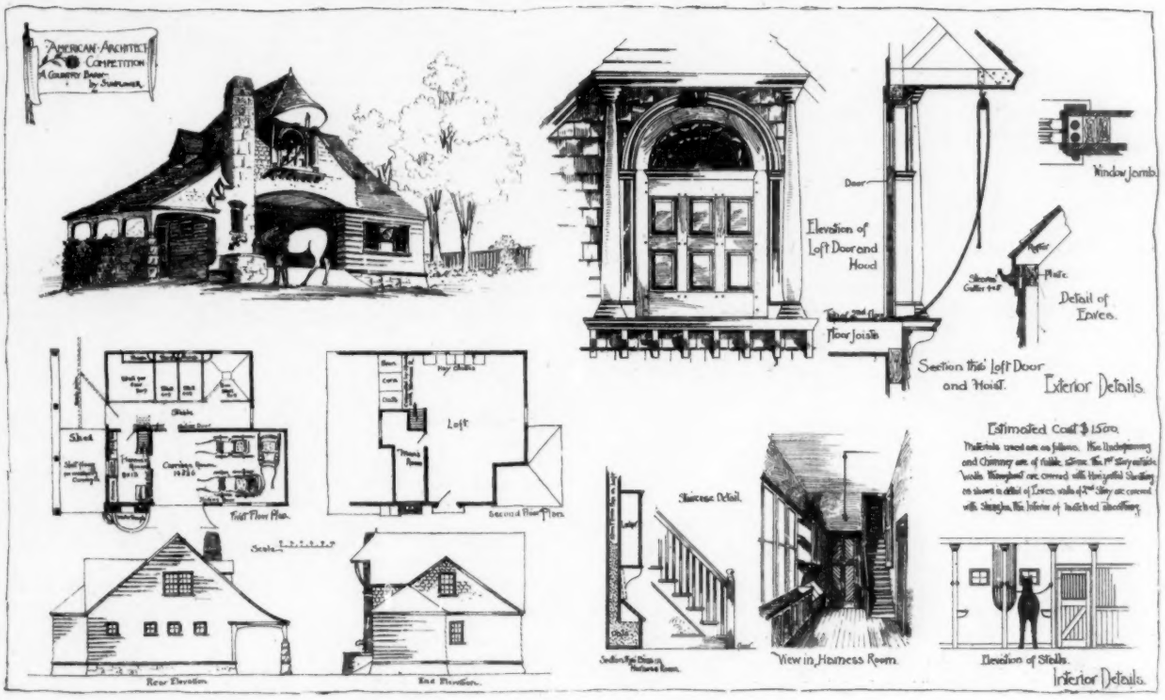
COPYRIGHTED 1885 JAMES R. OSGOOD & CO

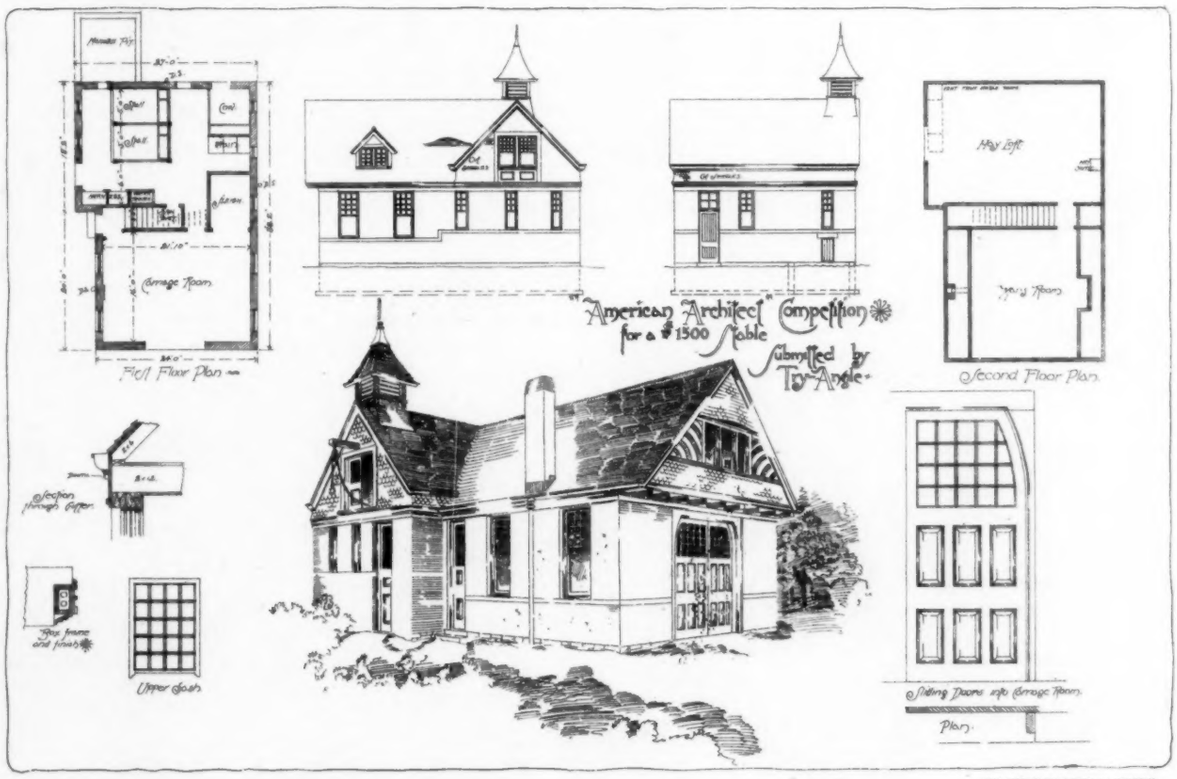


COMPETITIVE DESIGN FOR THE CINCINNATI CHAMBER OF COMMERCE · BRUCE PRICE, ARCHITECT, NEW YORK.

HELIOTYPE PRINTING CO. BOSTON

COPYRIGHTED, 1885, JAMES R. OSGOOD & CO





HELIOTYPE PRINTING CO. BOSTON

they very wisely and prudently, before commencing improvements, took in the whole situation by having prepared a sketch of their ultimate façade, and, adhering strictly to that, erected their first instalment as an integral part of the whole. The smaller drawing will explain the general design of the final block. The whole front as far as now built is of common brick and terra-cotta. Although it is to be regretted that the lack of time prevented the adherence to all the details of the architect's design (there being introduced into the work many and various samples of past work made from moulds on hand in the shop), still the result as a whole is broad and characteristic. The building is of mill construction throughout. A large quantity of manufactured goods were on the plank roof at the time of the late fire, and to the mode of construction is due the fact that the structure remained intact after a fire which would have brought an ordinarily constructed building to the ground.

COMPETITIVE DESIGN FOR A STABLE SUBMITTED BY "*Try-Angle.*"

CINCINNATI, O., December 17, 1884.

FROM estimates I have made from the plans and specifications of stable submitted by "*Try-Angle*," it can be built for $1,675.00.

J. M. GABLE.

COMPETITIVE DESIGN FOR A STABLE SUBMITTED BY "*Sunflower.*"

CONSTRUCTION OF THE BROMPTON ORATORY CUPOLA.[1]

Finial Notre Dame Paris.

HAVING said all that I consider necessary on the subject of marble, I think I could not do better than allude to the material of which the vaulting and cupola are composed, namely, concrete. Some ten years ago, when I first made an attempt to furnish a design for the Oratory Church, I was an ardent admirer of the ancient temple of Minerva Medica at Rome, which is circular, or rather pentagonal, on plan, and 75 feet in diameter, and surrounded by a concrete cupola, the apex of which is 85 feet from the ground. Now, with this example before me, I felt that what was done in the days of the Romans may be accomplished by the people of the nineteenth century, and so I suggested the same material for the ceiling of this church, the nave of which is 51 feet wide and the cupola 53 feet in internal diameter; but when the time arrived which made it necessary to be particular in giving instructions, I experienced a little anxiety about it, but nevertheless commenced in the case of the vaulting over the nave by filling up the haunch of one angle to a specified height, and then allowed it to rest. The opposite angle was next dealt with, and so on, after the same manner, until the four were filled up. By this time the first one was sufficiently set to allow the commencement of the vaulting proper, which was, I think, 14 inches thick, and finishing at the apex with a thickness of only 7 inches. To assist the workman in properly diminishing his thickness, I had a number of blocks of various heights temporarily tacked on to the centring by way of a gauge, which were easily removed as his work reached them, and his progress in one angle would be about 2 feet at a time, when he would leave it for the next angle, and so on until the completion of the four. It was then allowed to rest one month, when the centring was removed and transferred to do duty in another bay. My first impression was that the concrete could not be made to retain its shape unless it had some protection on the extrados, but my experience showed otherwise. It is true that the more perpendicular the curve the less should be the height of the rings. For instance, in the case of the dome, I first commenced with a few inches, and gradually thickened it, and after arriving at a certain thickness, of, say, 18 inches, I continued it by a 6-inch layer in a spiral manner, as one would wind the cord around a boy's top, and if the concrete is conscientiously made, a night's rest will enable the work done on the previous day to be sufficiently solidified to commence the next course; and the whole process seemed to be of the most simple description, and was carried out by an ordinary navvy. The composition of the concrete was originally specified as composed of six parts, viz., one of cement, two of washed sand, and three of crushed clinkers, engine slag, and burrs; but I must inform you that I eventually did not adhere to this arrangement, as I abolished the use of the slag and the clinkers totally, fearing that such an ingredient would prove detrimental to the surface of the plastering by unsightly stains, and consequently destroy the frescoes or such other decorative treatment as may hereafter be indulged in. I therefore confined myself to the brick burrs, with a slight admixture of crushed stone, a little ballast, and but a comparatively small quantity of sand. My reason for lessening the quantity of the latter is that, the brick burrs and the stone being broken by a steam crusher, it produced a large amount of dust and fine material, which did the duty of the sand; in fact, the proportion was continually varied, according to circumstances. All that was wanted was to secure a well-mixed composition, of the consistency of a puddle, and as free as possible from any adulteration of clayey gravel, and if I recollect rightly each cubic foot weighed just 112 pounds to 118 pounds, and, according to this calculation, each bay in the nave averaged from 60 to 70 tons in weight, and the cupola above the arches, including the upright portion of the dado, would reach to at least 2,000 tons, of which the marble columns have to take their proportion of the pressure. The time elapsed since this portion of the work was completed is two years, and during that period there has been no indication of weakness, or of its having played its part falsely; in fact, I look upon it as having done quite the reverse, and it has proved most satisfactory.

There always exists one enemy to deal with in adopting a concrete made with Portland cement, and that enemy is, I am sure, well known to you all — its tendency to expand on the point of setting; and although I demanded that all cement should be well air-slacked under my own observation for at least three weeks before using, the cupola did expand, and the result is most vividly seen in the outer octagonal wall of the cupola, which was started at the angles by the pressure conveyed to the eight buttresses. Notwithstanding the annoyance caused by this unfortunate propensity, it has many good qualities which we must all acknowledge, such as its great strength and facility for setting rapidly. For instance, let us inquire into the time occupied in forming the vaulting, and compare it with that which would be absorbed by a bricklayer. First, there were, I think, six men engaged in mixing the concrete; one assisting at the steam hoist, one with a barrow from the lift to the vault, and one navvy whom I shall call the distributor — nine men in all; and each bay with an arc of, say, 70 feet, and 30 feet wide, containing about 70 tons of material, was finished within a week — that is to say, we commenced on Monday morning and finished on the following Saturday evening; and I feel that if the same were executed in brickwork it would have occupied at least four times the period, and a proportionate increase of expense. The cupola, to the best of my recollection, was completed within three weeks of its commencement, but is not wholly of concrete, as the upper portion is built of brickwork in cement, and the ring upon which the stone lantern will ultimately rest is of Portland stone.

I feel it is needless for me to tell you that the present unsightly exterior of the cupola is only temporary, the design for the permanent structure being at least 11 feet more in diameter and 14 feet higher to the base of the lantern, which latter will add another additional 22 feet or thereabouts. Nothing has been definitely settled about the material with which it is to be covered, but at the time this portion of the work is undertaken, if the funds permit, I shall recommend its being covered with copper, on account of its lightness; but I would not hesitate to-morrow to use five-pound lead. I certainly look upon the circumstance of our not completing this part of the structure (whilst all the plant and machinery was at hand) as a great calamity, for to do so at a future date will probably increase its cost by about 70 per cent. You will observe the form that I have given to this section of the dome, which is considerably tilted, and at the point of rupture I have placed wrought-iron bands; not that I think they will contribute much to the stability of the structure after the concrete has set, but I thought they would assist in preventing a flaw while it was green. There can exist not the slightest doubt but that the cupola is one of the strongest of constructional forms, for although its section is that of an arch — but being circular on plan — it is really composed of an innumerable number of rings having a lateral bond, which must be torn asunder before any fracture can take place.

I may also inform you that it was my original intention to have embedded in the middle of the concrete vaulting hoop-iron bond interlacing each other, for the purpose of securing a toughness to the material; but subsequently I felt that the presence of iron in such a substance would eventually do more harm than good by its oxidation, and, on the other hand, if the concrete was unable to support it, no amount of hoop-iron bond would enhance its stability, and so I abandoned it altogether. Among the diagrams exhibited to you I have a drawing giving a bird's-eye view of the drum of the cupola, showing the general features of its construction, and also another giving a vertical section through the pendentives. In the first you will observe the method I adopted in lightening the weight of the drum by recesses and cavities, and also the expedient adopted to resist the lateral pressure of the ring on the four arches caused by the inward tendency of the four pendentives, which are so arranged that the force is resisted by the vaulting of the nave and transepts. A rough estimate of the weight coming on the four internal arches amounts to about 2,000 tons, less the reduction for the recesses, etc., 100 tons, or nearly 500 tons on each arch, which are composed of ten 4½-inch brick rings in Portland cement, bonded into each other and springing from skewbacks, as shown on the drawings, which I carried up in horizontal courses to at least one-third the height of the arch. This arrangement enabled me to get on to the top of the skewback the maximum of perpendicular weight, instead of throwing it on the extrados of the arch.

[1] From a paper read before the Civil and Mechanical Engineers' Society, Wednesday, March 25, 1885, by Herbert A. K. Gribble, A.R.I.B.A.

THE MISSISSIPPI RIVER-BED LEAKING. — Minneapolis, which has long boasted of having one of the best, if not the best, of water-powers in the world, is deeply disturbed over an apparent failure thereof. The water in the Mississippi has gradually been growing more unreliable for milling purposes for some time. Lately a discovery was made that about forty thousand gallons per minute are escaping from above St. Anthony's Falls in some mysterious manner. The supposition is that the water vanishes through a subterranean channel. — *Milwaukee Evening Wisconsin.*

THE RELATIONS BETWEEN ENGINEERING AND ARCHITECTURE.[1]

Lions' Heads. Assyrian Sculpture.

WHAT *are* the relations between engineering and architecture? We may take them to be, on a reduced scale, the relations between science and art. Indeed, it is scarcely an exaggeration to say that the numerous objects brought together in the great museums of science and art are but illustrations of engineering and architecture in the widest sense, with their accessory arts and sciences. These two great departments of knowledge and skill are complementary to each other, as the masculine and feminine natures, strength predominating in the one and grace in the other; and, although they have many characteristics in common, they have each their special place and functions. It may be useful, therefore, and will at least be interesting, to essay a brief consideration of their relative positions and values as honorable and lucrative professions. In order to get clear ideas on the subject, let us try to attach a definite meaning to the expressions employed.

What is engineering? For an answer to this question we naturally turn to the great Society which is the recognized embodiment of all that is foremost in the engineering world. Now, the Charter of the Institution of Civil Engineers contains a lengthy attempt at a definition of "that species of knowledge which constitutes the profession of a Civil Engineer." It is there described as "the art of directing the great sources of power in Nature for the use and convenience of man, as the means of production and of traffic in States, both for external and internal trade." This is the gist of the definition, which then goes on to specify five main branches of "the art," "as applied (1st) in the construction of roads, bridges, aqueducts, canals, river navigations and docks, for internal intercourse and exchange; and (2d) in the construction of ports, harbors, moles, breakwaters and light-houses; and (3d) in the art of navigation by artificial power for the purpose of commerce; and (4th) in the construction and adaptation of machinery; and (5th) in the drainage of cities and towns." This definition is not very clear, and not quite comprehensive. There is no mention of railway, mining, hydraulic, gas, or electric engineering; and it is only with great difficulty that these important branches of the subject can be brought within the scope of the definition. The fact that some of them had not been developed at the date of the Charter is not a sufficient answer to the objection, and even this explanation does not account for the omission of mines and water-works. Too much stress is laid on using the power of Nature "as the means of production and of traffic" for purposes of *trade*, whilst, at the same time, what has come to be called "sanitary engineering" is distinctly included. These considerations incidentally show the wisdom exercised by the founders of the Liverpool Engineering Society in adopting so expressive and practical and comprehensive a title, and in admitting to its membership "engineers of any branch of the profession." It is *engineering* with which we are concerned, not any one branch of it, not even such an extensive one as that known as *civil* engineering. And, without venturing on any exact definition, it will perhaps be sufficient to say that engineering is that entire system of knowledge and skill which comprises all mechanical pursuits so far as they supply the material wants of men.

What is architecture? "The art of ornamental and ornamented construction," chiefly as applied to buildings and such-like structures. Building, considered as a science, is clearly an important branch of engineering. And, as architecture is chiefly concerned with building, it follows that engineering is, in one aspect, an essential component of architecture, though the science may subsist without the art. In other words, whilst there can be no architecture without engineering, there may be engineering without architecture. Therefore we are led to the conclusion that architecture is the development and refinement of an important branch of engineering. Thus, in a certain sense, the profession of architecture is in its higher capabilities, more honorable than that of engineering. For it is disparaging to any particular architect to say of him that he is merely an engineer, since this is equal to saying that, so far as his artistic abilities are concerned, he is not an architect but a builder. And on the other hand it is not regarded as a discredit to an engineer to pronounce him to be no architect. The sum of these considerations is that engineering construction is scientific and utilitarian; whilst architectural construction is not only scientific and utilitarian, but is also ornamental, and even artistic or beautiful. This distinction is not exact, and cannot be made so. At the same time it is practically convenient, and expresses the principal facts.

Having cleared the way thus far, it may be profitable to inquire (1st) whether the relations between engineering and architecture are fixed and unalterable, and (2d) whether, if they are not permanent, it is desirable that they should be modified in practice. Now, when we endeavor to ascertain whether the relative positions of these pursuits are stable or not, we have to glance at their history. With regard to engineering, many of the mechanical arts and sciences comprised in it are so modern in their origin and development that they can hardly be said to have a history. Engineering, as a profession distinct from architecture, is a thing of to-day. Architecture also, as a "profession," is comparatively modern. But engineering and architectural pursuits have occupied men's talents and energies from the earliest times. They were always formerly practised by the same persons. The new feature is that they now diverge into separate channels. This is, of course, only a phase of the nineteenth-century system of the division of labor. And as that principle is constantly operating in all departments of knowledge and skill, and must go on dividing and subdividing every trade and profession as the knowledge and skill grow more exact and positive, it appears quite probable that engineering and architecture, as now understood, will never again be practised together to any great extent by the same persons at the same time. But, as we have said, it was not always so. And there is no reason in the essential nature of things why it should be so now. Chiefly what may be said is that the requirements of latter-day science have made it inconvenient and difficult for any one man to follow at once engineering and architecture equally well.

And, secondarily, it must be acknowledged that modern ideas as to the province of the architect have much to do with the severance which we are considering. It appears to be taken for granted that the work of the architect should be confined entirely to buildings. But the modern historian of architecture (Fergusson) maintains that "there are no objects that are usually delegated to the civil engineer which may not be brought within the province of the architect. A bridge, an aqueduct, the embankment of a lake, or the pier of a harbor, are all as legitimate subjects for architectural ornament as a temple or a palace. They were all so treated by the Romans and in the Middle Ages, and are so treated up to the present day in the remote parts of India, and wherever true art prevails." Now this is but equal to saying that in many large public works there is room for the engineer and the architect alike, or, at least, for their special talents. The architect should have some advantage, however, in the fact that the scope of his calling is wider, if fairly regarded, as it includes much that is simply engineering. But if the principle of the division of labor is to run to its natural issue, architecture will be considered as supplementary to engineering, not subordinate, perhaps, but rather superior, in the sense of its being the application of embellishment to the naked structure, or the incorporation of ornament into it, or the tasteful disposition of its parts. For, as Fergusson says, "where the engineer leaves off, the art of the architect begins. His object is to arrange the materials of the engineer, not so much with regard to economical as to artistic effects, and by light and shade, and outline to produce a form that, in itself, shall be permanently beautiful." If these considerations are allowed to have due weight, they tend to show that, although the connection between engineering and architecture has become relaxed, it is quite capable of being drawn tighter, and that the two branches of construction are by no means firmly settled apart, notwithstanding the force of convenience and custom, and the general disregard of art and beauty. It is, therefore, practically possible that the engineer should be more of an architect, and that the architect should be more of an engineer.

We may now turn to the second part of our inquiry. For if we have shown that the relations between engineering and architecture are not fixed and unalterable, the question naturally follows, whether it is desirable that those relations should be modified in practice. Now, the answer to this question will depend upon another, which has already been touched at some points: How does the present arrangement work? Take, for instance, the specially modern case of a railway and its appurtenances. The actual railway itself, both as to the surveys for its course and the planning and construction of its different parts, is the work of the engineer. The tunnels and bridges are as properly assigned to him as are the track and the signals. And, in many instances, the station buildings are regarded as coming equally within his province to design. If, however, the buildings are of great extent, and occupy an imposing site in a large town, they are sometimes put into the hands of an independent architect, with a view to insuring, amongst other things, a fairly artistic effect. This is constantly the case when the station buildings are connected with an hotel placed so as to mask the station itself. And, although the smaller or country stations are frequently designed by the engineers of the company, there are instances where high-class architectural firms are employed to take in hand everything in the nature of buildings connected with these stations, including even the roofs of iron and glass, which are often of greater extent than the actual buildings, and attract more readily the notice of the public. So that in these examples, whilst we see the architect and the engineer each venturing into the other's domain, or what is usually so considered, we see also that the architect is the chief aggressor, and gets most of the spoil. When, however, the engineer reaches the open country, or even the streets of the town, he works his own will on the bridges, viaducts, embankments, tunnels, ventilating shafts, *et hoc genus omne*. Especially with regard to goods-stations and warehouses, the engineer has it all his own way, and directs the expenditure of vast sums on these buildings, acting in the capacity of an ordinary architect. In this respect the architect may consider that his preserves are being poached by the engineer.

Turning now to another branch of engineering, that connected with water-works, what do we find? The reservoirs and pipe-lines, and the works connected therewith: tunnels, bridges and pumping-

[1] A paper read before the Liverpool Engineering Society, April 22, 1885, by W. Goldstraw.

stations, with their buildings and machinery, all come naturally within the engineer's legitimate business. And none of these works are now even thought of as belonging to architecture, although there is much scope for architectural taste in many of the embankments, aqueducts, towers, engine-houses and such-like structures. At any rate, since the rise of engineering as a separate profession, the architect has had to yield up possession of these works. When, however, the water has been duly conveyed to a large town, and the question of providing public baths and wash-houses presents itself, the architect either steps in or is called in, and the buildings at least, are made to receive the impress of his art, even though the actual purposes of the edifice have to be fulfilled by the special work of mechanical and hydraulic engineers. In some cases, it is true, the local authorities do not employ an independent architect, to design such buildings, but entrust them to their own town surveyor, borough engineer or water engineer, or whatever his official style happens to be. This officer, from the nature of his duties, has really a dual character: with regard to the now more or less distinct vocations of engineering and architecture, he has to fulfil a double function, which is, of course, not confined to the erection of the buildings we have mentioned, but extends to all the various engineering and architectural works of the public authority in whose service he is engaged. And so with the dock or harbor engineer. Although in his case, undoubtedly the bulk of his work is such as must be classified now-a-days as engineering, yet he is called upon to design and construct many buildings and other structures which have, or should have a decidedly architectural character, such as piers, light-houses, hydraulic-machinery buildings, public waiting-rooms and offices, clock-towers, and other erections. Here, again, the engineer may be said to trench upon the hereditary domains of his cousin the architect. Even in connection with the partially lapsed art of canal-making, the engineer is probably destined to renew his acquaintance with the architectural features of numerous locks, bridges and aqueducts, to be constructed (even in this iron age) for the most part of stone, which has always been the pet material of the architect. As to the followers of the more purely mechanical branches of engineering, so closely connected with machinery, they are developing a kind of natural affinity for architectural work in quarters, where it was least expected. In times not long past, the projectors of extensive factories and works to be fitted up with peculiar or costly machinery were accustomed to employ an architect for the erection of the building, and a special engineer for the supplying and fixing of the machinery. Considering that an ordinary architect is equally ready to design a church or a distillery, it is hardly surprising that his Ismaelite relation, the engineer, should wrest from him some of the specialities, and appropriate them to himself. Accordingly, we find new tribes of the great engineering family flourishing as gas-works engineers, sugar-works engineers, brewery engineers, cotton and silk mill engineers, and so forth, who undertake the designing and constructing of the great piles of building which are to enshrine the machines and engines required for that particular trade or industry. Occasionally it happens, nevertheless, that an architect of high standing, chiefly concerned with the more artistic side of his vocation, is employed to plan and execute buildings which are now by general consent, regarded as the proper work of the engineer. In such cases as these, whether it is of their own will, or at the will of the public, the members of the two professions are playing a friendly game of tit for tat. The present condition of things, then, appears to be this: —The practical relation between engineering and architecture are not sharply defined nor carefully observed.

We may now recur to the question whether these relations ought to be modified. If so, should the two great branches of constructive skill be drawn closer together, or should they be made more distinctively separate? Now, can it be maintained that the present state of affairs is satisfactory? This is not a quasi-philosophical question, but a very practical one. Two kinds of interests are involved in it — the interests of the persons whose occupation or livelihood is concerned in it, and the interests of art in its æsthetic aspect, whereby intellectual happiness is influenced. Well, in so far as uncertainty and confusion exist in the relations between engineering and architecture, it seems expedient that their boundaries should be more exactly laid down. Like two great political states, these two great professions, as they grow more powerful and approach more closely, have the greater need of a clear understanding as to their natural and scientific frontiers. In this age, few professional men can govern in both provinces. Even the admirable Crichtons will have enough to do with their talents in either domain. But as things are, we see one practitioner styling himself "Civil Engineer and Architect," whilst another is described as "Architect and Civil Engineer." These men are no doubt at present performing a special and useful function. But the race will die out. A pupil articled to such an engineering architect must be greatly perplexed by his divided allegiance to Rankine on the one side, and Palladio or Pugin on the other. It was much easier for Tintoretto to live up to his motto, "The day to Titian: the night to Michael Angelo," than for a nineteenth-century student to set his affections profitably on Gothic vaulting or the Ionic capital, when he is chiefly engaged in a sewerage scheme, or a system of tramways. Clearly, it is desirable that he should understand, as far as possible, the distinction between engineering and architecture, even if he has to draw an arbitrary line for his own observance. But in thus making the two professions more distinctively separate, there is no reason why the natural bond between them should not be respected or even drawn tighter. If architecture is the mother and engineering the daughter, they should be on good terms. Nevertheless, a man does not marry his mother-in-law, and as a rule they agree better when living apart. Let the engineer and the architect each stick to his last. Whilst, however, he practises his special calling only, he ought to have a considerable knowledge of the other profession in those points where he necessarily touches it. The architect cannot be well qualified generally if he is ignorant as to the capabilities of iron columns and girders, and of concrete floors, the overturning force of the wind, the pressures of embankments against walls, and the laws of mechanics. Nor can the engineer satisfactorily design his bridges and towers if he has no knowledge whatever of either the Classic orders or Gothic styles. For, although, as Fergusson remarks, "it is not essential that the engineer should know anything of architecture, it is certainly desirable that he should do so." On the other hand, it is indispensably necessary that the architect should understand construction. Without that knowledge, he cannot design; but it would be well if, in most instances, he could delegate the mechanical part of his task to the engineer, and so restrict himself entirely to the artistic arrangement and ornamentation of his design. This division of labor is essential to success, and was always practised where art was a reality; and no great work should be undertaken without the union of the two. "Perfect artistic and perfect mechanical skill can hardly be found combined in one person, but it is only by their joint assistance that a great work of architecture can be produced." If this be so, and it will hardly be doubted, the work of the man who styles himself architect and engineer is not likely to be of the very highest merit. In the present relations between the two professions, however, such a practitioner makes himself respected or feared on both sides, and deservedly so. But as the distinction between them becomes better defined and more generally recognized by the public, his position will be increasingly difficult, and in the end untenable, This need cause no regret, for, as we have seen, it is desirable in the interests of both professions that they should be as much as possible *practised* apart, even when a considerable acquaintance with both confers an advantage on its possessor.

We appear, then, to have been led, whether we are willing or not, to the conclusion that engineering and architecture ought to be made more distinctively separate. But can they not, at the same time, be in some way more closely united? If an ordinary man is not Colossus enough to bestride the strait between the two professions, may he not take his stand on one side, and join hands with his friend on the other? Now this thought brings us to a practical suggestion, with which this paper may fitly be drawn to a close. Seeing that engineering and architecture are both concerned with building work, and must always approach each other more or less nearly, it would probably be a successful working arrangement in many cases if a well-qualified engineer and a well-qualified architect were to join in partnership. Such a style as "Septimus Jones, F.R.I.B.A., and Orlando Smith, M. Inst. C.E., Architects and Engineers," if justified by the quality of the work done by the firm, would carry weight with the public, and would secure many commissions which Jones or Smith by himself would fail to get, or would imperfectly carry out. Thus we finish with a marriage, and every one is happy, or ought to be so. Should the blessing of Providence rest on it, and any good issue result from it, then the time spent in considering this subject will not have been utterly wasted.

SGRAFFITO WORK IN THIS COUNTRY.

PHILADELPHIA, PA., June 23, 1885.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — My attention has just been called to the inquiry of Messrs. Wahrenberger & Beekman, in your issue of June 6, and in reply thereto I will state that I have made sgraffito work to some extent during the last four years, for the interior and exterior decoration of buildings in Philadelphia and vicinity, and it has proved substantial and generally satisfactory.

Yours respectfully, J. GIBSON.

FRESH OR STALE PORTLAND CEMENT.

NEW YORK, June 22, 1885.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs,—Having noticed a question with an editorial comment on the above subject in the last number of your valuable paper, and being somewhat familiar with the subject, I take the liberty of throwing out a few hints which may prove to be of some interest to you and to many of your readers.

A good Portland cement, prepared on accurate technical lines, when kept in the barrels, and if preserved from damp and kept out of draughts, will retain its power and value for many years; it will become somewhat more slow-setting, but increases in cohesive power when set. If there is one quality in Portland cement more valuable than another, it is the property of retaining its power and value for an indefinite period of time.

In Germany, where testing is much more general than in any other country, and where, therefore, a better knowledge of the subject prevails, a manufacturer who would advertise his cement as being "*always fresh*," would render himself very ridiculous, because every

intelligent user of cement there knows very well, and has known it for years, that a Portland cement which is good only when fresh cannot be a first-class article. In fact, many German manufacturers of concrete, when buying first-class Portland cements, always ask for old cement, because they know from experience that it is stronger and more economical, allowing a larger addition of sand than the fresh cement.

Dr. W. Michaelis, of Berlin, gives the chemical analysis of a first-class German Portland cement as follows: —

Silica	22.850
Alumina	5,511
Oxide of iron	2,760
Lime	64,409
Magnesia	1,235
Potash of soda	0,923
Sulphate of lime	2,865

and of such always uniform, strictly first-class brands there are only three in Germany, and none that I know of in England. English architects and engineers, before using Portland cements, do well therefore in having them air-slaked, as described in your paper, a savage method which should never be applied to strictly first-class Portland cements, which do not contain free lime.

Further and more ample information can be gathered by the perusal of the best English book on the subject, Henry Reid's "*Practical Treatise on Natural and Artificial Concrete, and its Varieties and Constructive Adaptations*" (E. & F. N. Spon, 46 Charing-Cross, London, and 35 Murray Street, New York), showing, also, the danger, costliness and inadvisability of using inferior brands of Portland cements.

I am, Dear Sirs, Yours obediently,

Gustav Grawitz,

NOTES AND CLIPPINGS.

The Palazzo Reale, Naples. — "Those who know Naples," says the London *World*, "and, of course, the Palazzo Reale, will be much interested to learn that the King of Italy has ordered, at his own expense, eight life-sized marble statues to be placed in the existing niches on the façade of the palace. The personages to be represented are to be eight kings of Naples, viz: Roger, Frederick II, Charles I of Anjou; Alfonso, of Aragon; Charles V, Charles III, of Bourbon; Joachim Murat, and Victor Emanuel. The sculptors selected, all Neapolitans, are Amendola, Belliazzi, Caggiano, Jerace, D'Orsi, Franceschi, Gemito, and Solari."

The Arc de Triomphe, Paris. — The number of names of battles, sieges, and captured towns engraved upon the Arc de Triomphe, Paris, is 153, the first being the battle of Valmy (September 20, 1792), and the last the combat of Ligny, which preceded the battle of Waterloo, and is claimed by the French as a victory. The number of marshals, generals, and other field-officers whose names are also to be read upon the walls of the arch is 658, of whom 126 were killed upon the field of battle. The first of the 658 names is that of "Chartres," the son of Philippe Egalité, better known to history as Louis Philippe, who, like his father, distinguished himself at Valmy. Upon the summit of the arch, facing the suburb of Neuilly, is the inscription, which, translated into English, would read, "This monument, commenced in 1806 in honor of the Grand Army, for some time left unfinished, was continued in 1836 by King Louis Philippe I, who has consecrated it to the glory of the French armies." The Arc de Triomphe is the largest monument of its kind, being 165 feet high by 150 feet broad and 75 feet thick. It is rather more than double the height of the Arch of Constantine at Rome. The total cost of the Arc de Triomphe was £372,140. —*Exchange*

The Great Pyramid. — Mr. J. B. Bailey writes to the *St. James Gazette* as follows, with reference to the desirability of exploring the great pyramid: Now that Great Britain is dominant at Cairo, would it not be a good plan to clear away the sand and rubbish from the base of the great pyramid right down to its rocky foundation and try to discover those vast corridors, halls and temples containing priceless curiosities and treasures with which tradition in all ages has credited the great pyramid? The wonderful building, of such exquisite workmanship, was erected many years before any of the other pyramids, which are only humble imitations, built by another nation, and also for other purposes; for neither King Cheops nor anybody else was ever interred beneath this mighty mass of stone. The smaller pyramids also exhibit neither the nicety of proportion nor the exactness of measurement, both of which characterize the first pyramid. From internal evidence it seems to have been built about the year 2170 B. C., a short time before the birth of Abraham, more than four thousand years ago. This — one of the seven wonders of the world in the days of ancient Greece — is the only one of them all still in existence. The base of this building covers more than thirteen square acres of ground. Its four sides face exactly north, south, east and west. It is situated in the geographical centre of the land surface of the globe. It was originally 485 feet high, and each of its sides measures 762 feet. It is computed to contain 5,000,000 tons of hewn stone, beautifully fitted together with a mere film of cement. And these immense blocks of stone must have been brought from quarries five hundred miles distant from the site of the building. The present well-known king and queen chambers, with the various passages, might also be thoroughly examined by means of the electric or lime lights. The astronomer royal of Scotland some years since closely and laboriously examined all that is at present known of the interior of this enormous building. He states that measurements in the chambers, etc., show the exact length of the cubit of the Bible — namely, 25 inches. This cubit was used in the building of Noah's ark, Solomon's Temple, etc. He also maintains that the pyramid shows the distance of the sun from the earth to be 91,840,000 miles.

The Failing Connecticut. — The Connecticut River, given over to the timber-drivers, has become a canal. Reefs are blasted out. Bulkheads are built to turn the current into the central channels. The melting snows, no longer held back in the spongy mosses of the forests, and the spring rains, are hurried swiftly down in freshets which destroy property in the lower country. The freshets are utilized to bring down every spring the timber from thousands of acres, where no pine wood will ever grow again. The summer comes, hot and dry, with low water in the rivers, which were formerly full all the summer from the slow drain out of the dark shades in the upper country. The natural reservoirs, which thus gave out slowly their reservoirs of water, are gone, and all the water comes down with a rush after every rain. Manufacturing companies everywhere have found it necessary to make artificial reservoirs to take the place of the lost natural reservoirs. Hills that were once forest-covered are bleak masses of rock, growing drier year by year. If there was ever an instance of killing the goose that lays golden eggs, it is in this method of treating our northern forests. In hundreds of valleys, where water was abundant in former years, the water line in the ground is now below the reach of ordinary wells. The tendency is toward that condition which in a century or two will compel a resort to irrigation for ordinary agricultural purposes. —*Dr. W. C. Prime in the New York Journal of Commerce.*

The Daily Traffic over Broadway, New York. — Whatever may be thought of Jacob Sharp's Broadway surface-railroad, he has been the cause of the gathering of some interesting statistics regarding the enormous amount of traffic in Broadway. Four men were recently stationed at Fulton Street and Broadway to count the vehicles passing through Broadway at that point from 7 A. M. to 6 P. M. The total number was 22,308 for the period of eleven hours — about 2,000 an hour, thirty-three a minute, or one every two seconds. The largest number of any one kind of vehicles was of single and double trucks, 7,384; the smallest number was two; these were ambulances. There were 3,390 single and double express wagons. The 2,310 stages and the 1,022 cabs were next in order of quantity, pedlers' wagons numbering 933, produce wagons 446, rag trucks 375, carriages 354, coal carts 324, and venders' wagons 300. Then there was a drop to hacks, 288, and butcher wagons 223. The variety of vehicles was striking, there having been eighty kinds according to the schedule. Every conceivable article of transfer appears to be poured into Broadway. The private carriages were completely engulfed in the 150 ash-carts; the two ambulances and three funerals made a melancholy showing amid the seventy-three loads of dead hogs, the sixty-four garbage and the seventy-three dirt carts. The lager beer wagons and the orange pedlers flourished on an equality; the bone and lumber wagons went neck-and-neck; the pie and the sugar wagons were half-and-half, which should give the pies sweetness; the milk were left behind by the swill wagons. The mixture presented was something appalling. Kerosene, milk, old iron, sawdust, rags, sugar, ice, beer, bones, oranges, ashes, pie, hogs, tripe, tin, tallow, tea, tar and undertakers were commingled in a bewildering confusion. Broadway is certainly a remarkable thoroughfare. —*New York Tribune.*

Fire-Proof Doors. — The most efficient fire-proof doors are of wood covered with tinned iron. The door is made of two thicknesses of tongued and grooved boards, crossing each other diagonally and thoroughly nailed together. The sheets of tin are bent over at the edges, forming locked joints as in a tinned roof; it is important that the edges, as well as the sides of the door, be covered, as its resistance to heat lies in the fact that the fire cannot burn the wood thus protected against exposure to the air, nor can it warp it, as is the case with an iron fire-door subjected to slight heat. If a fire-proof door is hung on hinges, especial care must be taken to insure their security by fastening them to the door by means of bolts, rather than screws, and connecting them to the wall in an equally secure manner. The latches should be selected with a view to durability, as such a heavy door is apt to be destructive of weak latches. Where the position of the doorway permits sliding doors, it is preferable to have them on tracks, care being taken that cleats be placed on the floor each side of the doorway, so as to secure the door at its lower corners when shut. In the Boston Storage Warehouse, United States, there are a large number of such doors in the fire-walls, arranged to close an electric circuit when they are all shut, and the fact is recorded on the paper dial of the watchman's clock at certain intervals. Fire-proof doors are frequently arranged to close in advance of a fire by means of the yielding of an alloy fusible at 160° Fahr. The track upon which such a door is hung inclines about one foot in eight feet, and the door is kept from closing by means of a round stick about one inch in diameter, which reaches from one edge of the door to the opposite side of the door-frame. At the middle, the stick is cut in two diagonally, and a ferrule made of two pieces of thin copper soldered together longitudinally with the fusible alloy, covers the joint in the stick. When this ferrule is exposed to a temperature of 160° Fahr., its yielding causes the ferrule to split open, and the stick separates into pieces and allows the door to shut. In order that the stick shall not fall in the way of the door, and that the door may be shut at any time, the stick is connected to the top of the door-frame by small chains near to each end. This simple device was designed by Mr. Lewis T. Downes, president of the What Cheer Mutual Insurance Company. Another method of utilizing this fusible alloy to close fire-proof doors and shutters, is by means of a wire extending around the room, and containing in various places links made of two pieces of brass soldered together. When the solder melts and allows the two pieces of brass to separate, the wire allows the shutter or door to close. Mr. Frederick Grinnell has improved the ordinary link by cutting a slot in one of the pieces of brass, and laying a short bit of wire therein, when they are being soldered together; the solder flowing around this wire presents a resistance in three planes, in place of the ordinary joint, which may be imperfect and lies in a single plane, concealed by the sheet brass so as to prevent inspection. Formerly solid links of fusible alloy were used, but the metal has so little resilience that it is apt to gradually lengthen, and finally break at some inopportune time. — *Engineering.*

BUILDING INTELLIGENCE.

(Reported for The American Architect and Building News.)

[Although a large portion of the building intelligence is provided by their regular correspondents, the editors greatly desire to receive voluntary information, especially from the smaller and outlying towns.]

BUILDING PATENTS.

[Printed specifications of any patents here mentioned, together with full detail illustrations, may be obtained of the Commissioner of Patents, at Washington, for twenty-five cents.]

319,974. WATER-CLOSET.—Thomas Gunning and James Quigley, New Haven, Conn.

319,984. MIXED PAINT.—Thomas N. Le Ross, Rochester, N. Y.

319,999. SHUTTER-WORKER.—George E. Potter, Palmer, Mass.

320,002. VENTILATOR FOR GAS-MAINS.—James J. Ricketts, Pittsburgh, Pa.

320,022-024. HOISTING-DRUM FOR ELEVATORS.—Peter L. Weimer, Lebanon, Pa.

320,04 4. WEATHER-STRIP.—Orson E. Woodbury and Henry W. Storck, Madison, Wis.

320,066. FLOOR AND SIDEWALK CONSTRUCTION.—Peter H. Jackson, San Francisco, Cal.

320,072. FIRE-PROOF LATH FOR SLATES.—William H. Lane and Louis Lane, Newark, Ohio.

320,079. BEAM, JOIST, ETC.—Webster W. Martin, Boston, Mass.

320,083. AUTOMATIC HATCHWAY-GUARD.—Walter S. Morton, St. Paul, Minn.

320,097. AUGER.—James Swan, Seymour, Conn.

320,120. WEATHER-STRIP.—Joseph Fisher, Attleborough, Mass.

320,155. MORTISE-LOCK.—Frank W. Mix, New Britain, Conn.

320,161. WINDOW-BEAD FASTENER.—Charles R. Nelson, New York, N. Y.

320,163. WIRE-CLOTH LATHING.—William Orr, Trenton, N. J.

320,169. SAW-HANDLE.—Christopher Richardson, Newark, N. J.

320,175. SASH-FASTENER.—Jos. R. Rusby, Bloomfield, N. J.

320,180. CISTERN AND TANK CLEANER.—Raymond B. Scudder, New Orleans, La.

320,185. FRICTION DRILL-BRACE.—Richard S. Solomon, Cape Town, Cape of Good Hope.

320,195. WINDOW-SASH.—Henry Vale, Chicago, Ill.

320,203. STEAM-RADIATOR.—Juan B. Arci and John Chapman, Brooklyn, N. Y.

320,224. VISE.—George A. Colton, Syracuse, N. Y.

320,235. CONSTRUCTION OF SKYLIGHTS, ETC.—Alphonse Friedrick, Brooklyn, N. Y.

320,241. VENTILATOR.—Reinhold E. Henninges, Cleveland, O.

320,255. HINGE.—David K. Jackman, Poughkeepsie, N. Y.

320,289. WINDOW-SCREEN.—Morris Roberts, Philadelphia, Pa.

320,293. STONE-CUTTING MACHINE.—William L. Saunders, Jersey City, N. J.

320,323. RATCHET-BRACE.—John F. Allen, New York, N. Y.

320,324. GUTTER-BOX OR TROUGH.—Frederick Axt, Franklin, Ind.

320,327. SASH-FASTENER.—John W. Beatty, Erie, Pa.

320,329. DRIVE-SCREW.—Amos Broadnax, Brooklyn, N. Y.

320,353. SASH-FASTENER.—Reinhold E. Henninges, Cleveland, O.

320,357. WRENCH.—Jacob Huber, Toledo, O.

320,359. GRAINING WOOD.—George H. Hulmes, Chartiers, Allegheny County, and William Shope, Millvale, Pa.

320,371. ROCK-DRILLING MACHINE.—Martin Macdermott and William Glover, London, England.

320 373. DEVICE FOR DRIVING SCREWS.—Frank M. Maley, Cincinnati, O.

320,374. SAFETY DEVICE FOR ELEVATORS.—John H. Manning, Hartwell, O.

320,398. DEVICE FOR FLUSHING TANKS, SINKS, ETC.—Andrew Rosewater, Omaha, Neb.

320,4 9. DECORATING WALL HANGINGS AND OTHER FABRICS.—William Sochefsky, New York, N. Y.

320,411. VAPOR APPARATUS FOR HOT-HOUSES, ETC.—Hermann Steinke, Brooklyn, N. Y., and Max Limprecht, Union Hill, N. J.

320,4 8. ROOFING-GAUGE.—Amazon W. Brightwell, Owen, Ind.

320,435. TRAP FOR SOIL AND OTHER PIPES.—Samuel S. Hellyer, London, County of Middlesex, England.

SUMMARY OF THE WEEK.

Baltimore.

STORES AND DWELLINGS.—Morris Oppenheim, Esq., is to have built 2 three-st'y brick buildings on Pennsylvania Ave., near Biddle St., on lot 28′ x 120′, to cost $8,000, from designs by George Archer, architect; John Hoswell & Son, builders.

George Archer, architect, is preparing plans for Edward Ferry, Esq., for a two-st'y and attic frame cottage, 26′ 6″ x 35′, to cost $2,500.

BUILDING PERMITS.—Since our last report thirty-two permits have been granted, the more important of which are the following:—

John Bruno, 2 three-st'y brick buildings, s s Mulberry St., between Pine and Pearl Sts.

G. W. Donahue, 5 two-st'y brick buildings, e s Duncan Alley, s of Monument St.

John Mehagen, 2 two st'y brick buildings, s s Biddle St., s e cor. Proctor Alley.

Aug. Strunz, 2 two-st'y brick buildings, n e cor. Ridgely and Bayard Sts.

T. H. Graham, 2 two-st'y brick buildings, w s Gilmor St., and 2 two-st'y brick buildings, e s Vincent Alley, between Ramsay and McHenry Sts.

R. N. Moore, 5 two st'y brick buildings, w s Carlton St., between Saratoga and Lexington Sts.

J. A. McGregor, 13 two-st'y brick buildings, e s Payson St., between Ramsay and Christian Sts.

St. Paul Church, three-st'y brick building, s e cor. Cathedral St. and Chapel Alley.

Frederick Burger, 12 two-st'y brick buildings, n s Barney St., between Byrd St. and Riverside Ave.

Wm. Collett, 6 three-st'y brick buildings, w s Bolton St., between Laurens and Robert Sts.

Darby Thompson, three-st'y brick building, n s Chase St., between Charles St. and Maryland Ave.

L. C. Smith, 3 two-st'y brick buildings, n s Barney St., between Hanover St. and Goodman Alley, and 10 two st'y brick buildings, e s Charles St., between Birkhead and Clement Sts.

Jas. W. Lindall, 8 three-st'y brick buildings, w s Valley St., between Chase and Eager Sts.

Aug. Mencker & Bro., four-st'y brick warehouse, n w cor. Paca St. and Cider Alley.

L. Reitz & Bro., three-st'y brick building, s s Baltimore St., between Poppleton St. and Calendar Alley.

A. Lurman, three-st'y brick building, s w cor. Hillen and Forrest Sts.

Thos. H. Blick, 6 two-st'y brick buildings, w s Aisquith St., n of Point Lane, and 5 two-st'y brick buildings, e s Point Lane, n of Aisquith St.

ALTERATIONS.—Messrs. Deford & Co. are to make alterations to their warehouse, to cost $4,500, from designs by W. F. Weber, architect; Chas. Ogle, builder.

Boston.

BUILDING PERMITS.—*Wood.—Princeton St., No.* 349, dwell., 19′ x 28′; owner, Wilbur Goodwin; builder, Isaac Pratt.

George St., near Shirley St., dwell., 21′ x 42′; owner and builder, G. A. Clifford.

Rockwell St., 300′ from Milton Ave., dwell., 24′ x 30′; owner, W. P. Waterman; builder, R. M. Pitman.

Unnamed St., n of Quincy St., near New York & New England R. R., mechanical building, 18′ x 50′; owner, Thomas Rice; builder, A. C. Rice.

East Sixth St., No. 559, dwell., 24′ x 38′; C. A. Borden, owner; Jacob L. Smith, builder.

Brooklyn.

BUILDING PERMITS.—*Decatur St.*, s s, 125′ w Lewis Ave., 4 two st'y brick dwells., tin roofs; cost, each, $5,000; owner, Geo. W. Spear, 258 Grand Ave.; architects, Hall & Newkirk; builder, W. C. Spear.

Fulton St., s s, 300′ e Howard Ave., 10 three-st'y brown-stone dwells., gravel roofs; cost, each, $6,000; owner and builder, Thomas Donohue, 103 Stuyvesant Ave; architect, B. T. Hobbin.

Bushwick Ave., No. 553, e s, 82′ 7″ s Adams St., three-st'y frame (brick-filled) store and tenement, tin roof; cost, $4,000; owner and builder, Anton Kiesel, 559 Bushwick Ave.; architect, Th. Engelhardt.

Broadway, Nos. 419 *and* 421, n e s, 88′ n w Union Ave., rear of lot, 2 two-st'y brick dwells., tin roofs; cost, $5,000; owner, Caroline Broistedt, 378 Broadway; architect, Th. Engelhardt; builders, Geo. Lehman's Sons.

Broadway, Nos. 416 *and* 421, 2 four-st'y brick stores and tenements, tin roofs, iron cornices; cost, $16,000; owner, architect and builder, same as last.

South Portland Ave., No. 181, e s, 500′ s Hanson Pl., two st'y brick and brown-stone dwell., with stable, tin roof; cost, $8,000; owner, G. B. Wilson, 21 South Portland Ave.; architect, W. A. Mundell; builder, L. W. Seaman, Jr.

Greene Ave., n w cor. Nostrand Ave., 5 three-st'y brown-stone dwells., tin roofs; cost, each, $10,500; owners, G. H. Benner and L. Zeller, 81 Cedar St., New York; architect, A. Munch.

Fourteenth St., No. 181, s s, 77′ 10″ w Fourth Ave., two-st'y and basement brick dwell., tin roof; cost, $4,500; owner, Alexander Balmanno, 226 Seventeenth St.; architect, A. J. Staver.

Delmonico Pl., No. 31, e s, 51′ 6″ s Hopkins St., three-st'y frame (brick-filled) tenement, tin roof; cost, $4,370; owner, Wm. Kolb, Ellery St., cor. Delmonico Pl; architect, Th. Engelhardt; builders, J. Rueger and J. Fuchs.

Hart St., n s, 133′ w Marcy Ave., 6 two-and-a-half-st'y brown-stone dwells., tin roofs; cost, each, $5,000; owner, F. R. Boerum, Nostrand Ave. and Vernon Ave.; architect, I. J. Reynolds; builder, T. E. Greenland.

Berkeley Pl., s s, 359′ e Seventh Ave., 3 three-st'y brown-stone dwells., tin roofs; cost, each, $10,000; owner, David N. Boody, 206 Berkeley Pl.; architect and builder, E. B. Sturges.

Varet St., s s, 150′ e Bushwick Ave., three-st'y frame tenement, tin roof; cost, $4,000; owner, C. Becker, 146 Varet St.; architect, F. Holmberg; builder, J. Rueger.

Fulton St., s s, 100′ w Rockaway Ave., 10 three-st'y brown-stone stores and dwells., gravel roofs; cost, each, $5,000; owner, George R. Brown, 34 South Portland Ave.; builder, L. E. Brown.

Evergreen Ave., No. 157, e s, three-st'y frame dwell., tin roof; cost, $4,200; owner, M. Limmerothe, 186 Ellery St.; architect, H. Vollweiler.

Fairfax St., n s, 206′ e Broadway, three-st'y frame (brick-filled) hospital, tin roof; cost, $3,200; owner, German Evangelical Aid Society, on premises; architect, H. Vollweiler; builders, Mr. Danken and D. Kreuder.

Bergen St., n s, 225′ e Smith St., four-st'y brick flat, tin roof; cost, $11,500; owner, John Newman, Court St. and Bergen St.; architect, R. Dixon.

Sullivan St., No. 29, four-st'y brick tenement, tin roof; cost, $5,800; owner, Henry Spawer, 30 Wolcott St.; architect, L. Cook.

Ninth Ave., s e cor. Braxton St., three-st'y brick school, tin roof; cost, $16,000; owner, Thomas S. O'Reilly, Ninth Ave., cor. Braxton St.; architects, Parfitt Bros.

Hull St., n s, 200′ w Stone Ave., three-st'y frame (brick-filled) tenement, tin roof; cost, $4,200; owner, John Gardner, 2084 Broadway; architect, J. Puring; builder, M. Horn.

Downing St., w s, 150′ n Putnam Ave., three-st'y brick dwell., tin roof; cost, $4,500; owner, J. H. Watson, 424 Grand Ave.; architect, A. Hill.

Berkeley Pl., n s, 160′ w Seventh Ave., 3 three-st'y brick dwells., tin roofs; cost, $7,000; owner, John Monds, 92 Park Pl.; architect and contractor, J. J. Gillegan; mason, J. Monas.

Clay St., s s, 125′ w Oakland St., three-st'y frame tenement, gravel roof; cost, $3,900; owner, Patrick Reiley, Clay St.; architects and builders, Randall & Miller.

Bedford Ave., e s, 67′ 3″ s Flushing Ave., three-st'y frame dwell., tin roof; cost, $3,900; owner, Margaret Colgan, 231 Bedford Ave.; architect, S. Harbison; builder, C. Collins.

Greene Ave., n w cor. Washington Ave., 3 four-st'y brick and brown-stone dwells., tin and slate roofs; cost, $52,500; owner, Geo. Harvey, 149 Greene Ave.; architect, Mercein Thomas; builders, C. Cameron and M. C. Rush.

Hamburg St., s w cor. Magnolia St., three-st'y frame store and tenement; cost, $6,600; owner, Lorenz Debold, 18 Wall St.; architect and mason, E. Loersch; contractor, M. Metzen.

ALTERATIONS.—*Pierrepont St., No.* 118, interior alterations; cost, $4,000; owner, D. A. Houghtaling, 321 Clinton Ave.; architects, Eastman & Davis; builder, F. D. Norris.

Myrtle Ave., Nos. 680 *and* 682, three-st'y brick extension, tin roof, iron cornice; cost, $3,000; owner, etc., J. Clarke, 675 Willoughby Ave.

Chicago.

BUILDING PERMITS.—W. S. Hinkley, 4 cottages, Oakley Ave.; cost, $2,500.

S. W. Scoville, five-st'y factory, 94 to 102 West Washington St.; cost, $30,000; architects, Adler & Sullivan; builder, A. B. Cook.

Hewitt Manufacturing Co., factory, 213 Ontario St.; cost, $2,500.

V. Holacek, three-st'y flats, 719 Loomis St.; cost, $15,000.

F. Knaswicka, 2 three-st'y stores and dwells., 721 to 723 Eighteenth St.; cost, $12,000.

R. A. Bell, two-st'y dwell., 583 North Oakley St.; cost, $3,200.

A. Lewinski & Miketynski, four-st'y factory, 242 to 246 North Green St.; cost, $8,000.

D. Hays, four-st'y store and dwell., 103 West Adams St.; cost, $12,000.

J. A. Yale, 9 three-st'y stores and dwells., 168 to 184 West Van Buren St.; cost, $60,000.

M. Harris, addition, 123 Desplaines St.; cost, $3,000.

McKeever Bros., 4 two-st'y dwells.; cost, $16,000; architects, Thomas & Rogers.

J. T. Lund, three-st'y dwell., 213 Townsend St.; cost, $5,000; architects, Ostling & Bourgeois.

Mrs. H. Lewis, two-st'y dwell., 31 West Indiana St.; cost, $2,500.

J. L. Cochrane, 5 three-st'y dwells., 470 to 478 Elm St.; cost, $40,000; architect, L. J. Halberg.

D. F. Crilly, 12 two st'y dwells., North Park Ave.; cost, $25,000.

R. L. Martin, 6 three-st'y dwells., 92 to 102 Arlington St.; cost, $12,000.

R. L. Martin, two-st'y storehouse rear, 92 to 102 Arlington St.; cost, $10,000.

J. Berndt, two-st'y flats, 93 Gay St.; cost, $2,500.

W. H. St. Clair, five-st'y store, 171 to 173 West Madison St.; cost, $50,000; architects, Burnham & Hill.

G. W. Williams, two-st'y flats, 62 Evergreen Pl.; cost, $3,700.

C. J. Furst, 2 two-st'y dwells., 207 to 209 Wood St.; cost, $4,000.

C. C. Housel, 3 two-st'y dwells., 427 to 431 Centre Ave., cost, $15,000; architect, D. Biggot.

W. F. Hickox, 3 two-st'y dwells., 897 to 899 Monroe St.; cost, $18,000; architect, W. Thomas.

H. N. Hanson, two-st'y dwell., 895 Monroe St.; cost, $10,000; architect, W. Thomas.

Mrs. S. Troy, two-st'y dwell., 49 Maplewood Ave.; cost, $2,700.

Chicago City Railroad Co., additional story, 3052 to 3060 Archer Ave.; cost, $20,000.

J. A. Heath, 2 two-st'y dwells., 3128 to 3130 Prairie Ave.; cost, $13,000.

W. Sallevasser, two-st'y dwell., 109 Fremont St.; cost, $2,500.

W. D. Price, additional story, 117 to 123 State St.; cost, $10,000.

A. Stanford, three-st'y dwell., 101 North Centre Ave.; cost, $6,000.

C. R. Hickok, 2 two-st'y dwells., 3130 to 3132 Vernon Ave.; cost, $6,000.

J. P. McAssey, 2 two-st'y dwells., 480 West Taylor St.; cost, $3,000.

J. L. Campbell, 7 two-st'y dwells., Seeley Ave.; cost, $28,000.

Cincinnati.

BUILDING PERMITS.—Mrs. C. C. Brown, four-st'y brick building, Eighth and Cutter Sts.; cost, $6,500.

E. S. Freeman, three-and-one-half-st'y building, Gest St.; cost, $4,000.

Aug. Roy, two-and-one-half-st'y building, Findlay and Dalton Sts.; cost, $3,000.

Jacob Van Hart, two-st'y building, Melancthon and Central Ave.; cost, $2,200.

S. Richards, two-st'y building, Lincoln and Gilbert Sts.; cost, $16,000; J. H. Mach, builder.

International Panorama Co., two-st'y iron-clad, Seventh and Elm Sts.; cost, $25,000.

Mrs. Bitscher, Findlay and Linn Sts.; cost, $3,000.

Dr. Kaheler, two-st'y frame building, Baltimore Pike; cost, $2,100.

H. Lackman, two-and-one-half-st'y building, Coleman Ave., near Lafayette; cost, $3,500.

Wm. McCamon, Jr., five-st'y building, Race and Elm Sts.; cost, $20,000.

Henry Bosch & Bro. (Henry Thiely), two-st'y frame building, Fargus and Wayne Sts.; cost, $2,500.

Henry Bosch, two-and-one-half-st'y building Vine, and St. Clair Sts.; cost, $2,500.

St. George's Church, addition to two-st'y brick building, Calhoun and Madison Sts.; cost, $5,450.

Geo. Riemeschneider, Highland and Auburn Ave.; cost, $2,200.

J. W. Cotteral, two-st'y building, cost, $3,500.

H. Kracke, addition to two-st'y building, Fifth and Stone Sts.; Jasper & Erchbusch, builders; cost, $2,000.

E. Beckman, three-st'y building, Western Ave. and Findlay St.; cost, $4,500.

H. Fuchs, two-st'y building, 45 Ravine St.; cost, $3,000.

Repairs costing $8,935.

Total amount to date, $1,283,710.

Total permits, 587.

Kansas City, Mo.

CHURCH.—The Cavalry Baptist Society will probably build a $40,000 church.

THE Y. M. C. A. BUILDING.—The work of excavation for the new structure has been pushed the past week and the architect is busily engaged in drawing the plans and specifications for the new building.

BUILDING PERMITS.— H. C. Morrison, brick business block, 1424 Grand Ave.; cost, $4,500.

E. J. Gump, brick dwell., 1330 and 1332 Oak St.; cost, $6,500.

Minos Clark, brick dwell., Washington St.; cost, $7,000.

J. A. Swarthout, frame dwell., Troost Ave.; cost, $4,000.

Eugene Carlat, brick stable, Walnut St., bet. Thirteenth and Fourteenth Sts.; cost, $5,000.

T. H. Brougham, brick dwell., 615 West Sixteenth St.; cost, $3,000.

J. W. Jordan, brick business house, 1422 East Eighteenth St.; cost, $4,000.

H. W. Hatch, brick dwell., 513 and 515 Holmes St.; cost, $4,000.

W. Small, Jr. & A. W. Bristowe, brick dwells., 413 and 417 Oak St.; cost, $15,000.

Minneapolis, Minn.

BUILDING PERMITS.—Robert Russell, five-st'y brick store building, n e side Fifth St., bet. Hennepin and Nicollet Aves.; cost, $25,000.

Fletcher, Loring & Co., improvements on St. James Hotel, cor. Washington and Second Aves., s; cost, $7,000.

Fletcher, Loring & Co., two st'y brick store and flat, n w s Second Ave., s, bet. Washington Ave. and Second St.; cost, $6,000.

Loring & Windom, four-st'y stone business block, extension of Windom Block, 76′ front, Second Ave., s, below Washington Ave; cost, $35,000.

L. T. Soule Elevator Company, wooden elevator, Tenth St. and Twenty-ninth Ave, s e; cost, $20,000.

Anna Shay, double two-st'y wooden dwell., Marshal Ave, bet. Sixth and Seventh Aves., n e; cost, $2,500.

J. H. Weller, three-st'y brick veneer store, tenement and hall, cor. Franklin St. and Sixteenth Ave., s; cost, $7,000.

J. H. Towsley, two-st'y wooden dwell. and barn, Stevens Ave., bet. Lake and Thirty-first Sts., n w; cost, $4,750.

J. A. Huglin, three-st'y brick dwell., Fourth Ave., bet. Eighth and Ninth Sts.; cost, $6,500.

Minneapolis Bottle Manufacturing Co., one-st'y brick-and-wood factory, e s Thirty-eighth Ave., bet. Twenty-sixth and Twenty-seventh Sts.; s w; cost, $15,000.

James S. Lane, two-st'y wooden dwell., Seventh St., bet. Seventh and Eighth Aves., s e; cost, $3,000.

New York.

BUILDING PERMITS.—*Broome St.*, n w cor. Lewis St., four st'y brick tenement with stores, tin roofs; cost, $18,000; owner, John Katt, 314 Monroe St.; architect, J. Kastner.

West Seventy-first St., No. 413, 100′ w Ninth Ave., three-st'y brick and brown-stone dwell., tin roof; cost, $18,000; owner, Mrs. Julia A. Bull, Seventy-fifth St., cor. Boulevard; architect, H. J. Hardenbergh; builders, Jno. Bants and H. L. Hamilton.

Boulevard, cor. Tenth Ave., One Hundred and Thirteenth and One Hundred and Twentieth Sts., two-st'y and mansard brick detached asylum, tin and slate roof; cost, about $25,000; owner, Society of N. Y. Hospital; architect, R. Townsend.

Seventy-second St., s s, 175′ e Ninth Ave., 4 four-st'y brick and brown-stone dwells., mansard slate and tin roofs; cost, $40,000 and $50,000 each; owner, C. W. Luyster, 237 West Fifty-third St.; architect, J. H. Duncan.

One Hundred and Fifth St., n s, 375′ w Tenth Ave., 2 four-st'y Connecticut brown-stone tenements, tin roofs; cost, $25,000; owner and contractor, Donald Mitchel, 176 East Eightieth St.; architect, H. J. Hardenbergh.

West End Ave (Eleventh Ave.), n w cor. Seventy-eighth St., 8 three-st'y brick dwells., slate and tin roofs; cost, each, $9,000; owner, Henry H. Hewett, 411 West Twenty-eighth St.; architect, F. B. White.

Sixth Ave., n w cor. One Hundred and Twenty-third St., two-st'y Ohio stone church and parsonage, slate roof; cost, $80,000; owner, Reformed Low Dutch Church, Harlem, One Hundred and Twenty-third St. and Sixth Ave.; architect, J. R. Thomas; builders, List & Lennon.

Seventh Ave., w s, extending from One Hundred and Twenty-fourth St. to One Hundred and Twenty-fifth St., six-st'y brick family-hotel, tin roof; cost, $150,000; owner, Alva S. Walker, 43 West One Hundred and Thirtieth St.; architect, T. E. Thomson.

New Ave., n w cor. One Hundred and Forty-fifth St., 5 three-st'y frame, brick and tile dwells., shingle, slate, tile or tin roofs; owner, S. M. Milliken, 83 Leonard St.; architect, T. M. Clark.

East One Hundred and Twenty-ninth St., No. 119, four-st'y brick shop, tin roof; cost, $3,000; owner and builder, Thomas Overington, 501 East Forty-second St.; architect, R. Lomas.

Seventh Ave., w s, between One Hundred and Forty-first and One Hundred and Forty-second Sts., two-st'y and attic frame dwell., shingle roof; cost, $5,000; owner, M. Hammerstein, 203 East One Hundred and Fifteenth St.; architect, Alex. I. Finkel.

Seventh Ave., w s, from One Hundred and Forty-fourth to One Hundred and Forty-fifth St., one-st'y brick and timber engine repair shop, tin roof; cost, $21,000; owner, etc., Manhattan Railway Co., 71 Broadway.

Eighth Ave., e s, from One Hundred and Forty-fourth to One Hundred and Forty-fifth Sts., and east a distance of 525′ from Eighth Ave., five systems (three tracks each) of wood trestle storing cars and engines; cost, $35,000; owner, architect and builder, Manhattan R. R. Co., 71 Broadway.

Cypress Ave., s e cor. One Hundred and Forty-ninth St., three-st'y frame tenement, tin roof; cost, $4,800; owner, Lina Dahler on premises; architect, A. Pfeiffer; builder, not selected.

Washington Ave., No. 1132, four-st'y frame tenement and extension, tin roof; cost, $10,000; owner, Edward Baker, 341 West Twenty-eighth St.; architect, W. W. Gardiner; builders, Wiswell & Gander.

Church St., w s, 150′ s Putnam St., two-st'y frame dwell., slate and tin roof; cost, $3,000; owner, Mary A. Norton, Kingsbridge; builder, S. L. Berrian.

One Hundred and Eighty-fourth St., s s, about 100′ w Webster Ave., three-st'y frame dwell., shingle roof; cost, $3,000; owner, Peter Handibode, 1432 Franklin Ave.; architect, T. W. Ringrose; builders, P. Handibode and J. Richardson.

North Third Ave., w s, 25′ 9″ n One Hundred and Fifty-fifth St., four-st'y brick store and tenement, tin roof; cost, $8,000; owner, John D. Thees, 2314 Third Ave.; architect, A. Spence.

Dicison St., Nos. 136 *and* 138, five-st'y brick tenement, tin roof; cost, $14,000; owner, Fajbush Libman, 18 East Broadway; architect, Wm. Graul.

Henry St., No. 36, five-st'y brick tenement, tin roof; cost, $18,000; owner, Wolf Boroschek, 156 Henry St.; architect, Wm. Graul.

South Fifth Ave., six-st'y brick and iron factory, gravel roof; cost, $65,000; owner, W. B. Marvin, 265 Broadway; architect, Oscar S. Teale.

Broadway, n w Howard St., five-st'y brick, iron and stone warehouse, tin roof; cost, $35,000; owner, John S. Rice, et al., 28 West Forty-ninth St.; architects, A. Zucker & Co.

West Fifteenth St., No. 225, five-st'y brick tenement, with extension, tin roof; cost, $17,000; owner, Wm S. Wright, 36 West Twenty-seventh St.

West Seventeenth St., No. 450, five-st'y brick tenement, tin roof; cost, $14,000; owner, Andrew Ward, 516 Ninth Ave.; architect, J. F. Wilson; builder, Robert Hayes.

West Twenty-eighth St., No. 527, two-st'y brick stable, tin roof; cost, $600; owner, Frank Farrell, 524 West Twenty-ninth St.

East Fortieth St., No. 326, five-st'y brick tenement, tin roof; cost, $12,000; owner, Bridget Golden, 324 East Fortieth St.; architects, A. B. Ogden & Son.

ALTERATIONS.—*Liberty St., No.* 41, raised eighteen inches, new brick front, fire-proof stairs, iron beams; cost, $10,000; owner, Leonard J. Carpenter, 56 East Twenty-third St.; architect, H. J. Hardenbergh.

Carmine St., No. 76, raised one-st'y and four-st'y brick extension, tin roof; cost, about $6,500; owner, J. J. Campion, 20 East Tenth St.; architect, M. W. Morris.

East Fourth St., No. 98, repair damage by fire; cost, $4,500; owner, Joseph Schaeffler, 84 Second Ave.; architect, J. Boekell; builders, J. Schaeffler & Son.

East Thirty-ninth St., No. 33, 2 two-st'y brick extensions, tin roofs; cost, $6,000; owner, J. A. Hamilton, 7 East Thirty-fifth St.; architect, C. C. Haight; builder, L. H. Williams.

East Twenty-ninth St., No. 227, five-st'y brick extension, roof raised, front above first story taken down and rebuilt, internal alterations; cost, $5,000; owners, Chas. Dorn and J. Snitzer, 370 Third Ave.; architect, F. S. Barus; builder, not selected.

Bleecker St., Nos. 32, 34 *and* 36, and *Mott St., No.* 311, repair damage by fire and rebuild entirely fire-proof; cost, $85,000; owners, Schumacher & Ettlinger, 33 Bleecker St.; architect, E. E. Raht; builder, not selected.

Thirty-seventh St., s s, 56′ 6″ w Lexington Ave., four-st'y brick extension, tin roof; cost, $6,000; owner, Jas. C. Fargo, 56 Park Ave.; architect, J. H. Duncan; builders, McKenzie & McPherson.

West Sixteenth St., Nos. 310, 312 *and* 314, raised three stories, peak roof; cost, $40,000; owner, Thos. McMullen & Co., 44 Beaver St.; architect, A. Hatfield.

Madison Ave., Nos. 91 *and* 93, additional story on rear; cost, $4,000; owner, T. A. Emmet, 89 Madison Ave.; architect, T. R. Jackson.

West Twenty-fourth St., No. 20, three-st'y brick extension on front, also two and one-st'y rear extension, tin roofs; cost, $5,000; owner, Henry Hilton, Fourth Ave. and Ninth St.; architect, E. D. Harris; builder, F. Lyons.

Madison Ave., s e cor. Twenty-fourth St., one-st'y brick extension, tin roof, parts of cellar excavated, and new brick piers, etc., built; cost, $30,000; owner, Madison Square Presbyterian Church, on premises; architects, J. C. Cady & Co.; builders, M. Eidlitz & Son and Jeans & Taylor.

One Hundred and Sixty fifth St., s w cor. Twelfth Ave., building raised and moved; cost, $9,600; owner, Institute for Deaf and Dumb, Twelfth Ave., near One Hundred and Sixty-fifth St.; architect, O. P. Hatfield; builders, C. K. Terwilliger and C. N. Brainerd.

Tenth St., n e cor. West Fourth St., raised eighteen inches, one-st'y brick extension, internal, front and rear alterations, iron columns and beams; cost, about $5,000; owners, H. A. & M. Hartman, 46 Clarkson St.; architect, P. H. Gilvarry; builders, G. Derr and C. Lehmann.

Philadelphia.

BUILDING PERMITS.—*Smedley St.*, s of Venango St., 11 two-st'y dwells., 15′ x 42′; J. B. Clarey, contractor.

Greenway Ave., w of Seventy-first St., 2 three-st'y dwells., 16′ x 40′; R. H. Parker, owner.

North Juniper St., No. 225, three-st'y dwell., 17′ x 54′; G. Thompson, contractor.

Rex Ave., w of Twenty-ninth St., three-st'y dwell., 22′ x 30′; W. C. Macker, contractor.

Thirty first St., cor. Springfield Ave., 2 two-st'y dwells., 18′ x 65′; contractor, same as last.

Springfield Ave., e of Thirty-first St., 4 three-st'y dwells., 20′ x 48′; contractor, same as last.

Harvey St., w of Main St., 9 two-st'y dwells., 15′ 6″ x 21′; contractor, same as last.

Spruce St., w of Twenty-first St., 2 three-st'y dwells., 20′ x 77′; C. W. Budd, owner.

Howard St., n of Norris St., 9 two-st'y dwells., 14′ x 37′; W. Tecklenburg, contractor.

Adams St., near Commerce St., 4 two-st'y dwells., 14′ x 36′; I. L. Kelly, contractor.

Jasker St., cor. Taylor St., two-st'y factory; Eldredge & Stewart, contractors.

Clarkson Ave., w of Thirteenth St., one-st'y stable; W. R. Dougherty, contractor.

Ashmead St., w of Main St., 6 two-st'y dwells., 15′ x 36′; Wm. Garvin, contractor.

Furhill St., n of Huntingdon St., addition to factory; R. J. Whitside & Son, contractors.

Ontario St., w of Twentieth St., 2 three-st'y dwells., 16′ x 56′; Jno. Haverstick, contractor.

Spruce St., w of Forty-third St., alteration and two-st'y addition, 20′ x 20′; J. R. Garver, contractor.

Dacotah St., w of Thirty-second St., 13 two-st'y dwells., 16′ x 40′; W. F. Albright, owner.

Eighth St., between Free and Daley St., 7 two-st'y dwells., 15′ x 50′; owner, same as last.

Free St., between Seventh and Eighth Sts., 18 two-st'y dwells., 14′ x 40′; owner, same as last.

Mica St., w of Forty-fourth St., two-st'y dwell., 16′ x 43′; Jno. Aiken, contractor.

Maud St., w of Twenty-seventh St., 19 two-st'y dwells., 15′ x 39′; J. E. Ridgway, contractor.

Marston St., n of Columbia Ave., 3 two-st'y dwells., 15′ x 2′ 9″ and 39′; owner, same as last.

Mutter St., s of Lehigh Ave., 6 two-st'y dwells., 12′ x 28′; C. A. Snyder, owner.

Weber St., Nos. 2110 *and* 2112, one-st'y addition, 17′ x 56′; E. H. Flood, contractor.

Diamond St., w of Twenty-first St., two-st'y office, 19′ x 28′; contractor, same as last.

Eighth St., s of Lehigh Ave., 9 two-st'y dwells., 15′ x 50′; M. L. Heish, owner.

St. Louis.

BUILDING PERMITS.—Fifty-nine permits have been issued since our last report, thirteen of which are for unimportant frame houses. Of the rest those worth $2,500 and over are as follows: —

Mrs. C. Wohifurth, two-st'y brick store and dwell.; cost, $3,500; F. J. Capitaine, architect; F. C. Brehme, contractor.

Jos. Roser, two-st'y double brick tenement; cost, $3,400; G. L. Guber, contractor.

A. Schwalbe, two-st'y brick store and rooms above; cost, $3,000; H. Hofmeier, contractor.

J. A. Lynch, two-st'y brick dwell.; cost, $4,000; F. C. McCormack & Son, contractors.

Wm. Skramker, three-st'y brick store and dwell.; cost, $8,000; C. K. Ramsey, architect.

John Wildermuth, two-st'y brick dwell.; cost, $2,500; J. Wildermuth, contractor.

L. A. Bowlan, two-st'y brick dwell.; cost, $3,300; C. S. Dunn, architect; Jas. Flamory, contractor.

James A. Monks, five-st'y brick store-building, cost, $30,000; J. G. Cairns, architect: sub let.

J. J. Sylvester, two-st'y brick dwell.; cost, $10,000; Jos. W. Givens, contractor.

J. P. Nastinne, two-st'y brick dwell.; cost, $5,600; E. Mortimer, architect. J. V. Mayors, contractor.

John Shankey, two-st'y brick dwell.; cost, $2,900; J. B. Legg, architect; P. Brennan, contractor.

Wm. Brandt, 3 adjacent two-st'y brick tenements; cost, $5,000; P. Riechors, contractor.

Mrs. Gallagher, two-st'y brick dwell.; cost, $3,500; A. Beinke & Co., architects; P. Riechors, contractor.

Mrs. C. Bradburn, two-st'y double brick tenement; cost, $3,000; P. J. Bradburn, contractor.

A. Heburn, two st'y brick dwell.; cost, $2,800; John Low, contractor.

S. Hamaner, two-st'y brick dwell.; cost, $3,000; Paulus & Wiedmüller, contractors.

A. Weinrich, 2 double brick two-st'y tenements; cost, $7,000; A. Dietz, contractor.

Manewal Lange Cracker Co., two-st'y brick warehouse and office; cost, $8,000; Goesse & Remmers, contractors.

Dr. S. G. Moses, two-st'y brick store; cost, $9,000; F. D. Lee, architect; B. Weber & Co., contractors.

T. S. Noonan, two-st'y brick dwell.; cost, $3,500; O. McGinnis, contractor.

T. S. Noonan, two-st'y brick dwell.; cost, $3,500; O. McGinnis, contractor.

T. S. Noonan, two-st'y brick dwell.; cost, $3,500; O. McGinnis, contractor.

C. E. Fuchs, three-st'y brick store and rooms above; cost, $6,000; O. P. Koenig, architect; J. Marlztoff, contractor.

Gen. W. T. Sherman, one-st'y brick dwell.; cost, $2,600; C. Lingermann, contractor.

F. E. Espenshied, two st'y brick dwell.; cost, $4,500; J. H. Dunlap, contractor.

St. Paul.

BUILDING PERMITS.—Two-st'y frame double dwell., n s of Lincoln Ave., bet. Dale and Oakland Sts.; cost, $3,700; owner, Christopher Ruff.

Two-st'y brick store and dwell., s s of Susan St., bet. State and Greenwood Sts.; cost, $8,000; owner, Peter Rothausen.

Two-st'y brick veneer store and dwell., n w side of Rice St., bet. Iglehart and Thton Sts.; cost, $3,250; owner, A. W. Schwake.

Two-st'y frame dwell., s s of Fuller St., bet. Arundel and Western Sts.; cost, $2,500; owner, Margaret Carter.

Two-st'y frame college; cost, $4,000; owner, John Ireland.

Three-st'y brick business block, s s of East Seventh St., bet. Robert and Minnesota Sts.; cost, $18,000; owner, M. L. Potter.

Two-st'y frame dwell., e s of Josette St., bet. Martin and Fuller Sts; cost, $2,000; owner, John Lindquist.

Three-st'y brick double dwell., s s of Eleventh St., bet. Cedar and Minnesota Sts.; cost, $9,000; owner, James Cullen.

Two-st'y double frame dwell, e s of Wilkin St., bet. Ramsay and Exchange Sts.; cost, $5,000; owner, David Swank.

Two-st'y frame dwell. and barn, e s of Maple St., bet. Sixth and Seventh Sts.; cost, $2,000; owner, Mrs. E. R. Spindle.

The American Architect and Building News.

PUBLISHED EVERY SATURDAY BY

The American Architect and Building News Company,
211 TREMONT ST., BOSTON, MASS.
[No change in editorial management.]

Regular edition; $6.00 per year; six months, $3.50
Gelatine edition; $7.00 per year; six months, $4.00
12 Monthly Numbers, $1.75.

☞ Payment should be made to the publishers direct, either by draft or post-office order.

Advertising Agents.

Boston and Philadelphia: —
I. Henry Paige, 211 Tremont St., Boston.
New York City: —
H. M. Carleton, 21 Park Row.
Chicago, Ill.: —
Geo. K. Krigger, 883 Fulton St.

New Advertisements.

DODD & RICE M'F'G CO. (Hudson, N. Y.), Window Blind-Worker. Page 2, Supplement.
NATIONAL WIRE AND IRON CO. (Detroit, Mich.), Wire and Iron Work. Page iv.
C. S. GARRETT & SON (Philadelphia, Pa.), Paper Manufacturers. Page 2 Supplement.

BUILDING INTELLIGENCE.

St. Paul. (*Continued.*)

Two-st'y frame dwell., n s of Selby St., bet. Arundel and Western Sts.; cost, $2,000; owners, Chas. A. Reed & Bro.

Two-st'y brick stores and offices, e s of Dakota Ave., bet. Fairfield and Indiana Sts.; cost, $9,500; owner, Chas. D. Bell.

Two-st'y frame dwell., e s of Holly Ave., bet. Dale and St. Albans Sts.; cost, $2,500; owner, J. C. Wilson.

Two-st'y frame dwell. and barn, n s of Edmund St., bet. Oxford and Lexington Sts.; cost, $2,000; owner, T. R. Dick.

General Notes.

ATLANTA, GA.— Over $60,000 have been subscribed for the new Y. M. C. A. Building.

BELAIR, MD.—Allen Hoffman, Esq., is to build a two-st'y brick and brown-stone house, 35' x 47', to cost $3,000, from designs by W. F. Weber, architect, Baltimore.

HAMILTON, O. — Bids on the Butler County Court-house at Hamilton, Ohio, were opened on the 18th inst. Bids were submitted for each separate department, and, taking the lowest of such separate bids, the total cost amounted to $177,592.15. Bids were also submitted for the entire job, the lowest being Mr. F. Compton of Hamilton, $186,300. It will thus be seen that the lowest separate bids were $8,700 less than the lowest whole bid, notwithstanding which the contract was awarded to Mr. Compton at his bid.

Bids and Contracts.

BUFFALO, N. Y.— The bid of the Washington Slate Company, of Slatington, Pa. ($9.85 per 100), for roofing slate for the custom-house has been accepted.

CAIRO, ILL.— The following is an abstract of the bids on stone and brick fence walls, etc., for approaches to the Marine Hospital: —

R. Walsh, Cairo, Ill., $5,419.
Justin McCarthy, Washington, D. C., $8,400.
Chas. Lancaster, Cairo, Ill., $6,199.

DENVER, COL.— The following is an abstract of the bids for brick masonry of superstructure of court-house: —

E. F. Hallett Manufacturing Company, Denver, Col., $22,96 .
Hayes & McGilvray, Denver, Col., $22,330.

TOLEDO, O.— The bid of Wm. Williams, of Hyattstown, Md. ($11 per 100), for roofing slate for the custom-house has been accepted.

PROPOSALS.

STATE LIBRARY BUILDING.
[At Montpelier, Vt.
MONTPELIER, VT., June 26, 1885.

The undersigned, Commissioners appointed under an act of the Legislature entitled "An Act for the erection of a Building for the use of the State Library and other like purposes," and approved November 22, 1884, to which act reference is hereby made, invite sealed proposals for the erection of said building, according to plans and specifications therefor made by Joseph R. and Wm. P. Richards, architects.

Proposals will include the furnishing of materials.

The plans and specifications can be seen at the office of the architects, 44 Court Street, Boston, until and including July 9, 1885, and at the office of Pitkin & Huse, Montpelier, from July 10, 1885, to **July 20, 1885,** on which last-named day, **at 8 o'clock,** P. M., the proposals will be opened at the Pavilion Hotel, Montpelier.

The Commissioners reserve the right to reject any or all proposals, as they deem advisable for the interest of the State.

Proposals to be directed to "H. A. Huse, for Commissioners, Montpelier, Vt."

SAMUEL E. PINGREE,
E. J. ORMSBEE,
JUSTIN S. MORRILL,
H. H. POWERS,
REDFIELD PROCTOR,
J. L. EDWARDS,
H. A. HUSE.
} Commissioners.

498

WANTED.

SITUATION.— Wanted by a young man, situation as improver in a Boston Architect's office: neat draughtsman. First-class references. Small salary will be required. Address, F. F. E., office of this journal. 496

ARCHITECTS

can dictate specifications at our office to Stenographers or Type-writers familiar with architectural terms.

Accurate copies made on the
REMINGTON TYPE-WRITER.
Send for circular.
MARY SEYMOUR, 150 & 239 Broadway, N. Y.

PROPOSALS.

LIGHT-HOUSE.
[At Ludlam's Island, N. J.]
OFFICE OF THE ENGINEER,
FOURTH LIGHT-HOUSE DISTRICT,
POST-OFFICE BUILDING,
PHILADELPHIA, PA., June, 22 1885.

Sealed proposals will be received at this office **until 12 o'clock** M., **on Friday, the 10th day of July, 1885,** for furnishing the material and labor of all kinds necessary for constructing the light-house and keeper's dwelling at Ludlam's Island, N. J.

Plans, specifications, forms of proposal and other information may be obtained on application to this office.

The right is reserved to reject any or all bids, and to waive any defects. JOHN C. MALLERY,
Captain U. S. Army,
497 Engineer Fourth Light-House District.

LIGHT-HOUSE.
[At Port Sanilac, Mich.]
OFFICE OF LIGHT-HOUSE ENGINEER,
TENTH AND ELEVENTH DISTRICTS,
No. 311 WOODWARD AVENUE,
DETROIT, MICH., June 29 1885.

Sealed proposals will be received at this office **until 2 o'clock** P. M., **of Wednesday, the 15th day of July,** for furnishing the materials and labor of all kinds necessary for the completion and delivery on the light-house depot wharf at Detroit, Mich., of the metal work of the Port Sanilac light-house.

Plans, specifications, forms of proposal, and other information, may be obtained on application to this office.

The right is reserved to reject any or all bids, and to waive any defects.

CHAS. E. L. B. DAVIS,
Captain of Engineers, U. S. Army,
Engineer Tenth and Eleventh Light-house Districts.
498

STONE AND BRICK WORK.
[At Erie, Pa.]
OFFICE OF SUPERVISING ARCHITECT,
TREASURY DEPARTMENT,
WASHINGTON, D. C., June 23, 1885.

Sealed proposals will be received at this office until 2 P. M., **on the 28th day of July, 1885,** for furnishing and setting all the stonework and brickwork required for the superstructure of the court-house and post-office building at Erie, Pa., in accordance with drawings and specifications, copies of which may be seen and any additional information obtained at this office or the office of the superintendent of the building.

Bids must be accompanied by a certified check for $1,000 for stone and $500 for brick work, drawn to the order of "The Secretary of the Treasury."
498 M. E. BELL, Supervising Architect.

JOINERS' WORK AND WOOD FLOORING.
[At Frankfort, Ky.]
OFFICE OF THE SUPERVISING ARCHITECT,
TREASURY DEPARTMENT,
WASHINGTON, D. C., June 20, 1885.

Sealed proposals will be received at this office **until 2** P. M., **on the 20th day of July, 1885,** for furnishing and fixing in place all the joiners' work and wood flooring required for the court-house, post-office, etc., building at Frankfort, Ky., in accordance with drawings and specifications, copies of which may be seen and any additional information obtained on application at this office, or the office of the superintendent.

Bids must be accompanied by a certified check for $500, drawn to the order of the Secretary of the Treasury, as a guarantee that the bidder will enter into a contract, if his bid is accepted, and furnish a bond equal to the amount of the contract.

Bids received after the time of opening will not be considered. M. E. BELL,
497 Supervising Architect.

IRON BEAMS, ETC.
[At Rock Island, Ill.]
ROCK ISLAND ARSENAL, June 1, 1885.

Sealed proposals, in duplicate, to be opened **at 10 o'clock** A. M., **July 7, 1885,** are hereby invited to deliver on board cars at this arsenal about 270,000 pounds of 12-inch I beams, 125 pounds per yard; 7-inch deck beams, 58 pounds per yard; 4-inch I beams, 30 pounds per yard, and T and channel iron.

Full bids and specifications can be obtained from the undersigned.

The successful bidder must enter into contract and give good and sufficient bonds for the faithful performance of the same.

Iron to be delivered before June 30, 1886.

Bids from manufacturers who have not already made successfully the sizes of beams required will not be considered.

The United States reserves the right to reject any or all bids, or parts thereof.

Bids should be enclosed in sealed envelopes, marked "Proposals for Beams," and addressed to the undersigned.

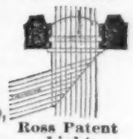
Bidders are invited to be present at the opening.
D. W. FLAGLER,
497 Lieut.-Col. of Ordnance, Commanding.

TO MEET THE DEMAND for good and cheap Railings, we offer this **Composite Iron Railing** at $1.50 per lineal foot, 3 ft. 6 in. high. The Chilled Iron Ornaments are poured on to the Wrought Iron Rods, welding the panel into one piece without joints, rust cannot enter. The posts and braces have large iron flange at base. You can set this fence into ground yourself. Stone foundations are not necessary, so that the $1.50 per lineal foot covers the whole expense. **Composite Iron Works Co 83 Reade St. N.Y.**

Sidewalk
— AND —
VAULT LIGHTS.

Sole Manufacturers of the

FLOOR and ROOF LIGHTS.



Ross Patent Light.

DAUCHY & CO.,
125 & 127 Indiana St., (near Wells),
CHICAGO, ILL.

H. W. JOHNS'
ASBESTOS
LIQUID PAINTS.
Sample Cards and Pamphlet
"Structural Decoration" sent free by mail.
H. W. JOHNS M'F'G CO., 87 MAIDEN LANE, N. Y.
175 Randolph St., Chicago; 170 N. 4th St., Philadelphia.

PHOTO- GELATINE / LITHOGRAPH / CAUSTIC / GRAVURE **PRINTING.**

The PHOTO-GRAVURE COMPANY,
853 BROADWAY, NEW YORK.

Great Improvement in Wash-Tubs.

Solid White Crockery Wash-tubs, manufactured under Morahan's patent. The only ones ever made in the world. Do not buy imitations until you see the genuine. Morahan's Patent stamped on every tub. Washboard and soap-cup moulded in every set.
Will outlast any house. Call and see them or send for price-list.
STEWART CERAMIC COMPANY,
312 Pearl Street, New York.

MACLAY & DAVIES,
City Surveyors and Civil Engineers,
120 and 697 BROADWAY,
(P. O. Address, Lock Box 110, Equitable Building.)
NEW YORK.
Specialty: City Surveying and Building Construction.

MY 100-PAGE ILLUSTRATED
CATALOGUE of BOOKS
On Architecture, Building, Carpentry, Drawing, Painting, Decoration, and Ornament,
Drawing Instruments, Builders' Level and Architects Materials,
Sent on receipt of three two-cent stamps.
WM. T. COMSTOCK. Astor Place, New York.

PROPOSALS.

PENITENTIARY.
[At Allegheny, Pa.]
ALLEGHENY, PA., June 29, 1885.

Sealed proposals will be received by the Board of Inspectors of the Western Penitentiary of Pennsylvania **until 7 o'clock** P. M. **of Tuesday, July 14th, 1885,** for the necessary excavation, piles and pile-driving, concrete and stone work, in the foundations of the new south wing of said penitentiary.

Separate bids will be received for each branch of the work.

Plans and specifications can be examined at the office of E. M. Butz, architect, No. 114 Federal Street, Allegheny.

The right to reject any or all bids is reserved.
EDWARD S. WRIGHT,
498 Warden.

ARMY BUILDING.
[At St. Paul, Minn.]
HEADQUARTERS DEPARTMENT OF DAKOTA,
OFFICE CHIEF QUARTERMASTER,
FORT SNELLING, MINN., June 14, 1885.

Sealed proposals, in triplicate, subject to usual conditions, will be received at this office **until 12 o'clock, noon, on the 7th day of July, 1885,** at which time and place they will be opened in the presence of bidders, for furnishing all labor and materials required for completion of Army Building, St. Paul, Minn., as follows: —

Builder's work, consisting of carpenter's, painter's, plasterer's work, etc., to complete building; steam-heating apparatus, complete, in place; hydraulic passenger-elevator, complete, in place.

Preference will be given to articles of domestic production and manufacture, conditions of price and quality being equal, and such preference will be given to articles of American production produced on the Pacific coast to the extent of the consumption required by the public service there.

Specifications and blank forms of proposal will be furnished to established manufacturers and builders, upon application to the office of the Depot Quartermasters, Chicago, Ill., St. Paul, Minn., or to this office. Plans referred to in specifications can be seen at the offices named.

Envelopes containing proposals should be marked "Proposals for Builder's Work, Heating-Apparatus, or Elevator," as the case may be, and addressed to the undersigned. JAMES M. MOORE,
Deputy Quartermaster-General, U. S. A.
497 Chief Quartermaster.

NOVELTY LOCK COMPANY,

CHICAGO, ILL., U. S. A.,

MANUFACTURE THE PRACTICAL, IMPROVED AND PERFECTED

DOOR KNOB.

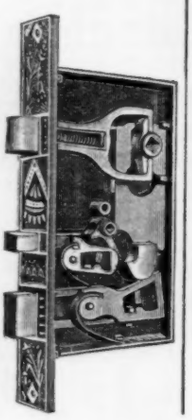
The most Simple Lock and Door Knob in existence, and the Strongest.

Property Owners planning to build, Architects, Contractors and Carpenters, write for new Illustrated Price-List and Sample Knob and Lock on hand-block, or a pair of Knobs and Lock for use on office or shop door when a trial is desired—complimentary. Address,

NOVELTY LOCK CO., 15 N. Clinton St., Chicago, Ill., U. S. A.

1885 CATALOGUE NOW OUT.

NON-PICKABLE DOOR LOCKS



Cost no more than ordinary locks. Turning the thumb-knob closes key-hole and fastens both knob and latch, and no key can be inserted from *outside*.

We also make

Two Bolt Locks and Latches, on same principle, with full Trimmings,

Send for Illustrated Catalogue. Sample locks sent to architects on request.

PERKINS SPECIALTY LUCK CO.,
CLEVELAND, OHIO.

J.B.&J.M.CORNELL,

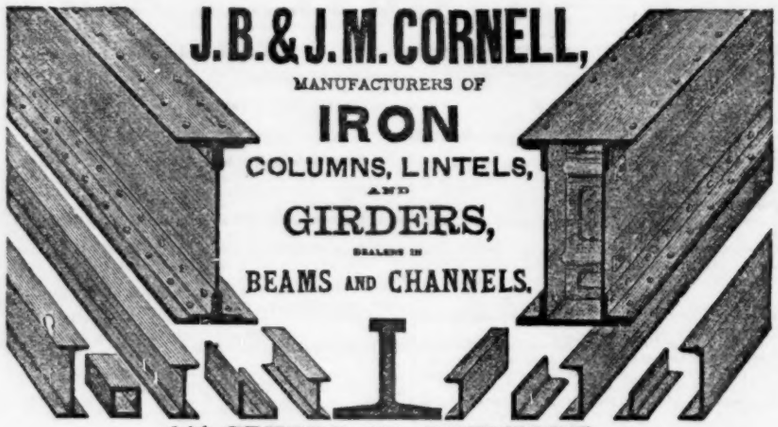
MANUFACTURERS OF

IRON

COLUMNS, LINTELS, AND GIRDERS,

DEALERS IN

BEAMS AND CHANNELS.



141 CENTRE ST., NEW YORK.

PROPOSALS.

IRON BRIDGE. [At Woodstown, N. J.]

Sealed proposals will be received by the undersigned **up to 11 o'clock,** A. M., **on the 8th day of July, 1885,** for the construction of an iron highway bridge on Main St., Woodstown, Salem County, New Jersey. Proposals to contain complete drawings of the proposed structure, and full description of the same, with strain sheets. The Board of Chosen Freeholders reserves the right to reject any or all bids. General data can be obtained by addressing the undersigned.

D. HARRIS SMITH,
Clerk of the Board of Chosen Freeholders, Salem, New Jersey. 497

IRON BRIDGE. [At Bergen, N. J.]

The Board of Freeholders of Bergen County, New Jersey, will receive sealed bids **up to 12 M., on the 8th day of July, 1885,** at the Westwood House, Westwood, N. J., for furnishing all the material and building an iron bridge over Pascack Run on the Westwood Ave., near the sawmill of Richard Hopper, of the following dimensions: Extreme length, 48′; distance between edge of abutments at top, 45′; width of roadway, 18′; rolling load 100 lbs. to the square foot of roadway; all material must be the best of their respective kinds.

Full plans, specifications and strain sheet must accompany each bid. Each bid must be accompanied by a satisfactory bond of $2,000, guaranteeing that the person or persons making such bids shall enter into contract at his bid, provided the contract is awarded to him or them.

The bridge to be completed by the 3d day of August, 1885.

By order of committee.

J. R. PULIS,
J. B. ECKERSON,
497 A. BOGERT.

CEMETERY LODGE. [At Baltimore, Md.]

OFFICE NATIONAL CEMETERIES,
WASHINGTON, D. C., June 20, 1885.

Sealed proposals, in triplicate, with a copy of this advertisement attached to each, will be received at this office **until 12 M., Monday, July 20, 1885,** for the construction of a Superintendent's Lodge of brick or stone at the Loudon Park National Military Cemetery, Baltimore, Md.

Plans and specifications for the work may be seen at quartermaster's office, No. 160 West Fayette Street, Baltimore, Md.; at the Loudon Park Cemetery, and at this office; where, also, blank forms of proposals will be furnished on application therefor.

Proposals will be submitted only on the forms supplied for that purpose, and bidders are required to furnish sureties in the sum of $2,000, as guarantee of their responsibility.

The right is reserved to reject any or all bids.

Bids should be endorsed "Proposals for Lodge at Loudon Park Cemetery," and addressed to the undersigned.

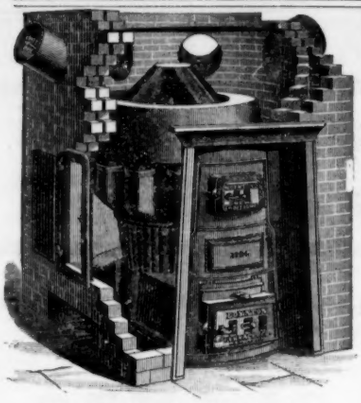
They will be opened at this office at the hour and date above specified, in the presence of such bidders as may then and there attend.

R. N. BATCHELDER,
498 Deputy Q. M. Gen'l, U. S. Army.

Classified Advertisements.

[Advertisers can be indexed only under a single head free of charge.]

ANNUNCIATORS. PAGE
Edwards & Co., New York iv
W. K. Ostrander & Co., New York ix
Western Electric Co., New York & Chicago ... viii
ART JOURNALS.
Decorator and Furnisher Co., New York 2
Montague Marks, New York 4
ASBESTOS FELT.
The Asbestos Packing Co., Boston & New York xix
ASBESTOS PAINT.
H. W. Johns M'f'g Co., New York xi
ASPHALT. Henry R. Bradbury, New York x
New York Mastic Works 1
BELL FOUNDERS.
H. McShane & Co., Baltimore iv
BLIND-AWNINGS.
F. A. North & Co., Boston ix
BOILER COVERING.
Shields & Brown, Chicago vii
BOOKS AND JOURNALS.
Wm. T. Comstock, New York xi
J. R. Osgood & Co. Boston xviii
Sanitary News, Chicago xviii
BRASS-WORK.
J. B. Shannon & Sons 3
BRICK (ORNAMENTAL).
Anderson Pressed Brick Co., Chicago xviii
Excelsor Brick Co., Phila., Pa. xviii
Hydraulic Press Brick Co., St. Louis xviii
Peerless Brick Co., Philadelphia xviii
Waldo Bros., Boston xviii
BUILDING PAPER.
C. S. Garrett & Son, Phila., Pa. 2
Scott Paper Co., Phila. xiv
CARPETS.
W. & J. Sloane, New York i
CEMENT.
James Brand, New York xviii
Baetjer & Meyerstein, New York xviii
Brooks, Shoobridge & Co., New York iv
Howard Fleming, New York x
Gustav Gravitz, New York xviii
Johnson & Wilson, New York xx
Marcial & Co., New York iv
Sinclair & Pabson, New York, N. Y. xviii
Standard Cement Co., Hartford, Conn. xviii
CHAIR-SEATING.
A. H. Andrews & Co., New York and Phila. .. ix
Harwood Chair Seat Co., Boston ix
CLOCKS FOR PUBLIC BUILDINGS.
Seth Thomas Clock Co., Thomaston, Conn. .. iv
CONDUCTORS (WATER).
Austin, Obdyke & Co., Philadelphia ii
Boston Spiral Tube Works, Boston ii
Solderless Standing-Seam Conductor Co., Allegheny, Pa ii
CONTRACTING. Flynt Building & Construction Co., Palmer, Mass. i
COPPERSMITHS AND METAL-WORKERS.
G. L. Swett & Co., Boston iv
CORNICES (GALVANIZED IRON).
Mesker & Bro., St. Louis, Mo. xv
CREOSOTE STAINS.
S. Cabot, Jr., Boston v
DECORATIVE LEATHER.
C. R. Vandell & Co., New York i
DECORATORS.
Cox Sons, Buckley & Co., New York ii
L. Haberstroh & Son, Boston iii
La Farge Decorative Art Co., New York ii
Donald McDonald, Boston ii
W. J. McPherson, Boston iii
Frank Hill Smith, Boston iv
William Wright, New York iii
DOOR-HANGERS.
Cohoes Iron Foundry and Machine Co., Cohoes, N. Y. iv
ELECTRIC-LIGHT WIRING.
Greenfield & Klein, New York ix
ELEVATORS, ETC.
E. Brewer, Boston v
Crane, New York & Chicago i
L. S. Graves & Son, Rochester, N. Y. i
Geo. C. Howard, Phila. v
H. B. Martin, Chicago, Ill. v
Moore & Wyman, Boston i
Morse, Williams & Co., Philadelphia iv
Otis Brothers & Co., New York i
Stokes & Parrish, Philadelphia i
M. B. Swezey, Chicago, Ill. v
Whittier Machine Co., Boston i
Z. Wile, Boston v
ENGINES (CALORIC PUMPING).
Delamater Iron Works, New York x
ENGINES (GAS).
Schleicher, Schumm & Co., Philadelphia ix
FIRE-PROOF BUILDING.
Fire-Proof Building Co., New York xix
Frank Lyons, Jr., New York xix
Henry Maurer, New York xix
Ottawa Tile Co., Chicago xix
Raritan Hollow and Porous Brick Co. xix
John J. Schillenger, New York xix
Wight Fire-Proofing Co., New York xix
FLOORS (INLAID).
National Wood M'f'g. Co., New York xx
Wm. Hannam & Co., New York xx
W. C. Runyon & Co., Rochester, N. Y. xix
W. E. Wheeler, Toledo, O. iv
FLOORS (WATER-TIGHT).
W. L. Dolbeare, Boston 3
FRET-WORK.
C. S. Ransom & Co., Cleveland, O. ix
FRICTION-CLUTCH.
A. & F. Brown, New York v
FURNITURE. Degraff & Taylor, New York ix
GAS-FIXTURES.
Archer & Pancoast M'f'g Co., New York x
Mitchell, Vance & Co., New York i
Oxley, Giddings & Enos, New York i
GAS-MACHINES
Combination Gas-Machine Co., Detroit ix
Denny Bros. & Co., New York ix
Pa. Globe Gas-Light Co., Phila. ix
Pittsburgh Supply Co., Pittsburgh, Pa. ix
Tirrill Gas-Machine Co., New York ix
GAS-STOVES.
Goodwin Gas-Stove Co., Phila vii
GLASS.
Crystal Plate-Glass Co., St. Louis, Mo. iii
GLASS ROOFING.
Arthur E. Rendle, New York i
GLASS (STAINED AND ORNAMENTAL).
James Baker & Son, New York ii
Wm. Coulter & Son, Cincinnati ii
Decorative Glass M'f'g Co., Chicago, Ill. ii
George Draue, Cleveland, O. ii
Otto F. Falck & Co., New York ii
Alfred Godwin & Co., Phila. ii
GLASS (STAINED) (*continued*).
R. S. Groves & Steel, Philadelphia ii
H. Edgar Hartwell, New York iii
John Matthews, New York iv
McCully & Miles, Chicago ii
W. J. McPherson, Boston ii
Donald MacDonald, Boston iii
Redding, Baird & Co., Boston ii
Samuel West, Boston ii
GRATES, ETC.
J. S. Conover & Co., New York xx
Henry Dibblee, Chicago iii
Eureka Grate Works, Cincinnati, O iv
W. H. Harrison & Bro., Philadelphia vii
W. Jackson & Son, New York vii
Edwin A. Jackson & Bro., New York x
Wm. H. Jackson, New York xx
Chas. J. Smith & Co., Cincinnati, O. vi
GUTTER.
D. Newton Newport, R. I. xviii
HARDWARE.
Burditt & Williams, Boston iv
Nashua Lock Co., Nashua, N. H. 4
Nichols, Bellamy & Co., Boston, Mass. v
A. G. Newman, New York 3
HARNESS BRACKET.
Jas. J. Read, Boston 4
HEATING APPARATUS.
Bartlett, Hayward & Co., Baltimore 1
B. C. Bibb & Son, Baltimore, Md. vii
Boynton Furnace Co., New York xiii
Abram Cox Stove Co., Philadelphia, Pa. vii
J. Reynolds & Son, Phila. vii
HEATING APPARATUS (STEAM).
Bates & Johnson, New York vii
John Davis & Co., Chicago, Ill. vii
"Florida" Boiler Works Geneva, N. Y. viii
Gorton Boiler M'f'g Co., New York 4
A. A. Griffing Iron Co., Jersey City xx
Newell Universal Mill Co., New York vii
New York Steam Co., New York viii
Page Steam-Heating Co., Norwich, Conn. iv
Rutzler & Blake, New York City iii
H. B. Smith Co., New York vii
St. Louis Heating and Ventilating Co., St. Louis, Mo. viii
James P. Wood & Co., Philadelphia i



(Boynton's New Gas-Tight Furnace.)

Boynton Furnace Co.,

94 BEEKMAN ST., N. Y.

Sole Owners and Manufacturers of

BOYNTON'S CELEBRATED FURNACES,

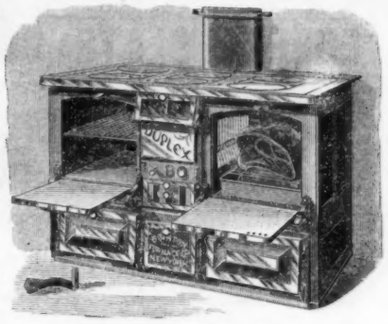
Ranges, Baltimore Heaters, etc.

With 1883-4-5 Improvements.

N. A. BOYNTON, *President.*
C. B. BOYNTON, *Sec. & Treas.*
} Inventors of all "Boynton" Furnaces, which have been on the market for over 33 years.

40 Years in this line of Business.

Over 50,000 "Boynton" Furnaces now in use.



(Boynton's Duplex Roasting and Broiling Range.)

As a priming coat 40 pounds of "Ulesote" is equal to 100 pounds of White Lead.

TRADE ULESOTE MARK

Acts as a thorough preservative, and therefore particularly adapted for all structural painting.

"ULESOTE" PAINT.

The attention of Architects, Builders, House Owners and Agents is called to this new Paint, which for its wearing Properties, Covering Capacity, and great Economy in Use has no equal in the market. It is produced from a Pure Metal Pigment and ground in the Best Linseed Oil. Contains no deleterious or injurious substances.

MADE IN MANY DESIRABLE COLORS,

and put up in Paste and Liquid Form (ready for use). Testimonials and Sample Cards on application. Correspondence invited. Manufactured solely by

H. F. TAINTOR

281 Pearl Street, New York.

THE LARGEST MANUFACTURERS IN THE UNITED STATES
— OF —

STABLE FITTINGS.

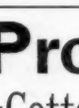
[Established 1843.]

HAY RACKS, MANGERS, ETC., ETC.

☞ Send for Prices and Catalogues.

SAMUEL S. BENT & SON,
111 Chambers St., New York.

Frank O. Worthley's Broad-Gauge Iron Stalls,



Improved Mangers, Gutters, Screens, Clock Feeders, Stable Trimmings and Novelties are the result of ten years' experience and the making of the best fittings. **53 Elm St., Boston. Illustrated Catalogue free.**

Brick and Stone Water-Proofing Co.

Water-Proofing for Brick, Stone, Terra-Cotta, Stucco, etc.

ALSO FOR INTERIOR WALLS.

The disintegration of stone, the weather-staining of brickwork, the crumbling of mortar joints and the efflorescence of salts, so very noticeable on most of the finest buildings, **CAN BE PERMANENTLY PREVENTED,** and the buildings kept fresh and clean in appearance, by treating them with the above-named process.

This is the only process that will render brick and stone **PERMANENTLY WATER-PROOF** and which is **ABSOLUTELY COLORLESS AND INVISIBLE. Its PERMANENCY** is due to its being a **SOLID COMPOUND, BURNT IN BY HEAT,** and is **NOT** a fluid, such as oil or paint.

We are also prepared to clean stained and decayed buildings, or marble and stone in any other form, in a superior manner to any other process, and defy competition. **BROWN-STONE FRONTS AND STOOPS** cleaned and permanently preserved from decay.

Catalogues will be sent or any information furnished, also estimates made on buildings now standing or to be erected, by applying to or addressing the above-named Company at its offices,

55 Broadway, New York, Room 43, or 886 8th Av., near 53d St. Elevated R. R. Station,

Classified Advertisements (Continued).

HEATING AND VENTILATING.
Smith & Anthony Stove Co., Boston, Mass. viii
HELIOTYPE PROCESS.
Heliotype Printing Company, Boston xviii
HINGES. M. W. Robinson, New York..... ..xv
HINGES (SPRING).
Van Wagoner & Williams Co., New York....xx
HORSE-STALLS.
Frank O. Worthley, Boston.....xiii
INSURANCE.
American Fire Ins. Co.... x
Insurance Co. of North America, Phila.....x
IRON-WORK (ARCHITECTURAL).
Bartlett, Hayward & Co., Baltimore.....i
Boston Bridge Works.....iv
Carnegie Bros. & Co., Pittsburgh, Pa.....xv
Cheney & Hewlett, New York.....xvi
Composite Iron Works, New York.....xi
Cooper, Hewitt & Co., New York.....xvi
Samuel J. Creswell, Philadelphia.....xv
J. B. & J. M. Cornell, New York... xii
J. G. & T. Dimond, New York.....xv
Manly & Cooper M'f'g Co., Phila xv
McIlvse & Lyon, Dayton, O.....xv
Mesker & Bro., St. Louis, Mo.....xvi
A. Northrop & Co., Pittsburgh, Pa.....xv
Passaic Rolling Mill Co., Paterson, N. J....xvi
Pennsylvania Construction Co, Pittsburgh, Pa.....xvi
Phœnix Iron Co., Philadelphia.....xv
Poulson & Eger, New York xv
J. S. Thorn, Phila., Pa.....xvi
Union Foundry and Pullman Car Wheel Works, Chicago, Ill.....xv
J. P. Walton, Cincinnati, O.....iv
Wallis Iron Works, Jersey City, N. J.....xv
KILNS. W. D. Thompson, New York.....ii
LOCKS.
Butler & Constant, New York 4
Novelty Lock Co., Chicago, Ill.....xii
Perkins Specialty Lock Co.....xii
Yale & Towne M'f'g Co., Stamford, Conn...xx
MACHINERY.
W. F. & John Barnes, Rockford, Ill.. iii
Goodell & Waters, Philadelphia..... xvi
MACHINERY (LAUNDRY).
Troy Laundry Machinery Co., Troy.....xx
MANTELS.
Joseph S. Miller & Bro., Philadelphia.....vii
A. A. Riley, Chicago, Ill.....vii
MANTELS (SLATE).
Fischer-Leaf Co., Louisville, Ky.....vi
MARBLE MOSAICS.
J. Pasquali & C. Aeschlimann, New York...iii
Stillman & Nicoll, Boston, Mass.....ix
MARBLE-WORKERS.
A. L. Fauchere & Co., New York.....ii
Robert C. Fisher, New York.....i
METAL-WORKERS.
J. & R. Lamb, New York.....ii
MINERAL WOOL.
U. S. Mineral Wool Co., New York.....iv
MORTAR COLORS.
Samuel H. French & Co., Philadelphia.....iv
MORTAR BLACK.
Henry D. Dupee, Boston.....xviii
OILS. Robert Colgate & Co., New York.....4
OIL FINISH.
Berry Bros., Detroit, Mich 2
PAINT.
F. W. Devoe & Co., New York.....vi
Liquid Glass Paint Co., Hartford, Conn....iii
H. F. Taintor, New York.....xiii
PHOTOGRAPHS.
J. W. Taylor, Chicago, Ill.....1
PHOTO-GRAVURE.
Photo-Gravure Co., New York.....xi
PENS.
The Esterbrook Steel Pen Co., New York....2
PIPE-COVERING.
The Chalmers-Spence Co., New York.....vii
PORTLAND CEMENT.
E. Thiele, New York.....3
PUMPS (STEAM).
Knowles Steam-Pump Works, New York & Boston.....viii
H. R. Worthington, New York and Boston..v
REFLECTORS.
Bailey Reflector Co., Pittsburgh, Pa.....xx
I. P. Frink, New York.....xx
REGISTERS.
Tuttle & Bailey Man'f'g Co., New York and Boston.....xvi
ROLLING-SHUTTER.
J. G. Wilson, New York.....x
ROOFING MATERIALS.
Cambridge Roofing Co., Cambridge, O.....xiv
Cincinnati Corrugating Co., Cincinnati, Ohio.....xv
W. Ehret Roofing Co., Philadelphia, Pa.....x
Eureka Slate Co., Poultney, Vt.... xiv
Garry Iron Roofing Co., Cleveland, O.....xiv
Merchant & Co., Phila.... xiv
N. E. Felt Roofing Co., Boston.....xiv
ROOFERS.
John Farquhar's Sons.....x
RUGS. T. O. Hague, New York.....4
SANITARY SUPPLIES.
Myers Sanitary Depot, New York..... ...xx
Sanitas Manufacturing Co., Boston.....xvi
SASH-CHAINS.
Thomas Morton, New York... vi
Smith & Egge M'f'g Co., Bridgeport, Conn...xx
SASH-CORD.
J. P. Tolman & Co., Boston... x
SASH-LOCKS.
Chandler & Farquhar, Boston.....xvi
SCENERY (THEATRICAL).
Lafayette W. Seavey, New York.....xx
SCHOOLS (ARCHITECTURAL).
Cornell University, Ithaca, N. Y.....2
Institute of Technology, Boston.....2
SCREENS.
American Screen Co., Brookline, Mass.....ix
E. T. Burrows & Co., Portland, Me.....ix
SEWER-GAS TRAP.
B. P. Bower & Co., Cleveland.....xvii
SHINGLE-STAINS.
S. Cabot, Jr., Boston.....v
SHUTTERS.
Clark, Bunnett & Co., New York..... xx
SKYLIGHTS, ETC.
Buckelhoupt Bros., New York.....viii
G. Hayes, New York..... viii
S. J. Pardessus, New York.....viii
John Seton, Brooklyn.....viii
G. L. Swett & Co., Boston..... .iv
E. Van Noorden, Boston..... viii
SLATE.
American Bangor Slate Co., Bangor, Pa....xiv
Boyle & Co., Phila., Pa..... xiv
T. F. & J. A. Hayden, St. Louis, Mo..... ..xiv
Story & Wilbur, Boston.....xiv
Monson Slate Agency, Lowell, Mass.....xiv
SLIDING DOOR RAIL.
Geo. F. Taylor & Wood, New York.....xvi
SNOW-GUARDS.
M. Halliday, New York.....xiv
John H. Hiller, Boston.....x
STABLE FITTINGS.
Samuel S. Bent & Son, New York.....xiii
STATUARY (BRONZE).
National Fine Art Foundry, New York.....xv
STONE (BUILDING).
Hallowell Granite Co., Bedford, Ind.....xviii
M. H. St. John, New York.....xviii
Malone & Co., Cleveland, O..... xviii
Ohio Building Stone Co., Cleveland..... i
G. P. Sherwood, New York.....xviii
Thomlinson & Reed, Chicago.... xviii
SURVEYORS.
Maclay & Davies, New York.....xi
TERRA-COTTA.
Baltimore Terra-Cotta Co., Baltimore, Md...xix
Jas. H. Beggs & Co., Wilmington, Del xviii
Boston Terra-Cotta Co..... xix
A. T. Chur, New York.....xviii
A. Hall Terra-Cotta Co., Perth Amboy.....xix
Northwestern Terra-Cotta Wks., Chicago...xix
Indianapolis Terra-Cotta Co., Ind'polis.....xix
H. A. Lewis, Boston..... xix
TERRA-COTTA (*continued*).
Perth Amboy Terra-Cotta Co..... xix
TILES.
American Encaustic Tiling Co., New York...i
T. Aspinwall & Son, New York..... i
Alfred Boote, New York.....i
J. K. Brigham, New York..... iii
John Chadwick, New York.....xi
Henry Dibblee, Chicago..... iii
International Tile Co., New York.....iii
J. G. & J. F. Low, Chelsea, Mass.....iii
Miller & Coates, New York..... i
Fernando Miranda, New York.....i
O. D. Person, New York..... xix
Sharpless & Watts, Philadelphia..... ii
U. S. Encaustic Tile Co., Indianapolis.....i
TRAPS.
F. E. Cudell, Cleveland, O.....xvii
TYPE-WRITER.
Amry Seymour, New York.....xi
VALVES AND PACKING.
Jenkins Brothers, New York.....x
Peet Valve Co., Boston..... x
Washburn & Moore, Yonkers, N. Y.....xvii
VARNISH.
Murphy & Co., New York.....2
VAULT LIGHTS.
Dauchy & Co., Chicago..... xi
VENTILATION.
Globe Ventilator Co., Troy, N. Y.. viii
E. Van Noorden & Co., Boston, Mass.....viii
WALL PAPER.
C. H. George, New York.....iii
WASH-TUBS (PORCELAIN).
Stewart Ceramic Co., New York.....xi
WATER-CLOSETS.
E. Aspinall, New York..... xvii
J. L. Mott Iron Works, New York.....xvii
WATER-PROOFING.
Brick & Stone Waterpr'f'g Co., New York..xiii
WINDOW-BLIND WORKER.
Dodd & Rice M'f'g Co., Hudson, N. Y.....2
WINDOW-BLINDS.
Morstatt & Katzl, New York..... 2
WINDOW-FRAMES.
Chicago Window Improvement Co., Chicago, Ill.....3
WINDOW-SASH.
H. A. Streeter, Chicago, Ill.... 2
WINDOW STUD.
C. R. Nelson, New York. 2
WIRE LATHING, ETC.
Clinton Wire Cloth Co., Clinton, Mass. v
Corrugated Wire Lathing Co., New York...xix
WIRE AND IRON WORK.
National Wire & Iron Co., Detroit, Mich.....iv
WOOD-ORNAMENT.
The Tuft Co., Hartford, Conn..... 4

Roofing Materials.

EUREKA SLATE CO.,
Quarriers and Dealers in

THE ONLY PURE UNFADING GREEN ROOFING SLATE.

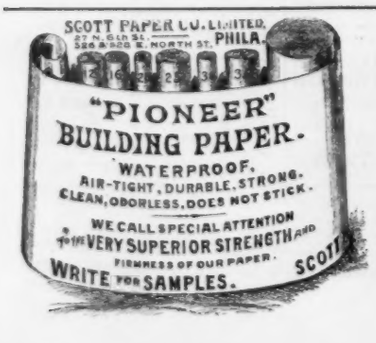
PURPLE, SEA GREEN, RED, and BLACK SLATES.
Also Billiards, Paving Slabs, Mantels, Urinals and all Kinds of Slate Works.
Eureka Slate Quarries, Poultney, Vt.
Outer Temple Building,
Strand, London, England.
Send for Price List.

STORY & WILBUR,
Formerly A. Wilbur & Co. (Established 1821.
EMPORIUM FOR
ROOFING SLATES
We have the entire production of
MERRILL'S
BROWNVILLE (MAINE) SLATE
ALSO THE
MONSON (MAINE) SLATE,
Both of which are Black and Unfading and the standard Slate of the market. Used by all Boston architects for first-class buildings, and the cheapest slate in the market for the quality. Also,
WELSH, BANGOR PENNSYLVANIA, STAR PENNSYLVANIA, BLACK DIAMOND PURPLE and GREEN SLATES
Roofing-Tin, Zinc, Solder, Nails, Elastic Cement, Rozin-Sized, Tarred and Dry Felts.
RED SLATES.
Our stock of Slates embraces over 20,000 squares, of all grades and prices. Particular attention to shipments by vessel or rail, for export or home trade.
Special rates by car-loads from quarries.
Inquiries promptly answered.
Slate Wharves, 529 Commercial St.,
Joseph Story. BOSTON. S. A. Wilbur.

BOYLE & CO.,
419 Walnut Street, Philadelphia.
WHOLESALE
SLATE
MERCHANTS.
Close prices furnished for
Roofing Slate, Machinery Foundations, Sills, Caps, Lintels, Steps, Stairways, Flagging, Hearths, Mantels, Chimney-Caps, Wainscoting, Tanks, Vats, Grave-Boxes, Vaults, or anything made of slate.

Unfading Black Roofing-Slates.
From the Monson (Maine) Slate Quarries.
These Slates are uniform in thickness, very strong, smooth surfaces and unfading in color.
For sale by
MONSON SLATE AGENCY.
P. O. BOX 337, LOWELL, MASS.

T. F. & J. A. HAYDEN,
WHOLESALE DEALERS IN
ROOFING SLATE
Cor. Twelfth and Locust Sts. St. Louis Mo.



CARRY IRON ROOFING CO.
The largest manufacturers of Iron Roofing in the world. Manufacturers of all kinds of **Iron Roofing**, Crimped and Corrugated Siding, Iron Tile or Shingles, fire-proof Doors, Shutters, and Iron Frames for Roofs and Buildings.

IRON ORE PAINT,
And Cement.
152 to 158 MERWIN ST.,
Cleveland, Ohio.
Send for Circular and Price-List No. 21.

GUARANTEED
ROOFING PLATES.
The following are a few of the opinions of practical tinners as to our Guaranteed
GILBERTSON'S
"OLD METHOD."

Monroeville, Ohio. Dec. 22, 1884.
After twenty-five years' experience running a tin-shop, doing roofing work, etc., I am free to say I have never seen any Plates that equal the *Gilbertson's Old Method* Ternes lately purchased of you.
It is all you claim for it, and on my own buildings I think I shall use no other, and shall try to have my customers let me use it for them, as I consider it economy to do so.

Marquette, Mich., Nov. 21, 1884.
As regards the *Gilbertson's Old Method* that we bought of you, would say that it is first-class and works the same.

Gallatin, Tenn., Aug. 21, 1884.
I congratulate you on your success. I think you have outstripped your competitors.

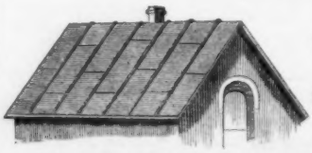
Indianapolis, Ind., Oct. 22, 1884
Your *Old Method* Plate gives better satisfaction than any Redipped Tin I have ever worked.

Bristol, Tenn., Nov. 11, 1884.
We think the *Gilbertson's Old Method* A No. 1.

Lanesville, Ind., Sept. 3, 1884.
The *Old Method* is splendid.

MERCHANT & CO.,
525 Arch Street, PHILADELPHIA.
Cliff and Beekman Streets, NEW YORK.

THE AMERICAN BANGOR SLATE CO.
Miners and Manufacturers of PENNSYLVANIA
BLACK ROOFING SLATE,
FLAGGING and other products from the famous Bangor Slate beds. The products of these beds are of uniform color, and are equal in strength and quality to any produced in Pennsylvania. ☞ It will pay builders and contractors to address THE AMERICAN BANGOR SLATE CO. BANGOR, PA.



Crowl's Patent Iron Roofing.
The only Double-Capped Corrugated Roofing, and the only one prepared by the manufacturers ready for laying.
PLAIN IRON ROOFING,
Corrugated Iron for Siding and Roofing, and Corrugated Edge Roofing.
These goods are exhibited at the New Orleans Exposition.
Agents wanted everywhere.
CAMBRIDGE ROOFING COMPANY, - - Cambridge, Ohio.

DUGAN'S PATENT
SNOW GUARDS FOR SLATE AND OTHER SLANTING **ROOFS.**
Send for Illustrated Circular and Price List.

M. HALLIDAY,
Sole Proprietor and Manufacturer,
218 East Ninth Street, New York.

Iron-Work.

UNION FOUNDRY
—AND—
Pullman Car-Wheel Works.

Architectural Iron-Work
A SPECIALTY.

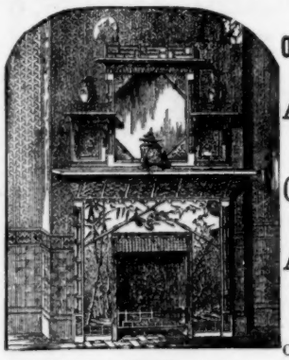
Dealers in Beams, Channels, Angles, and Shapes, both Iron and Steel.

Correspondence solicited and prices given on all classes of Iron-Work.

ESTABLISHED 1852. N. S. BOUTON, Pres't.

OFFICE, 164 DEARBORN ST., CHICAGO.

THE HECLA ARCHITECTURAL BRONZE & IRON WORKS.



POULSON & ECER,

Office and Ware-rooms, 216 and 218 W. 23d St., New York.

Works, N. 11th and 3d Sts., Brooklyn, E. D., L. I.

Artistic Metal Mantels and Over-Tops, in

BRONZE, BRASS,

Oxidized-Iron, Galvano-Plastic, and Electro-Plated Iron.

Architectural and Ornamental Cast and Wrought Iron Work of every description.

Correspondence with Architects and Builders solicited. Illustrated Catalogue and Price-List on application.

McHOSE & LYON, Dayton, Ohio,

ARCHITECTURAL IRON WORKS.

IRON FRONTS FOR BUILDINGS,

Columns, Girders, Wrought-Iron Fencing, Prismatic Sidewalk-Lights, Iron Stairs. All kinds of Iron-Work used in Buildings. Grey Iron Steam-Fittings.

Designs and Estimates furnished on application.

CORRUGATED

IRON ROOFING

SIDING, CEILING.
ARCHES AND LATH.
CINCINNATI
CORRUGATING CO.
CINCINNATI. O.
SEND FOR ILLUSTRATED CATALOGUE.

CRIMPED

Rolled and Drawn Steel Hand Rail, in 20 Feet Lengths.

Ornamental Iron Works.

MANLY & COOPER MANUF'G CO.

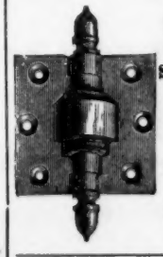
ELM AVENUE AND 43d STS., PHILADELPHIA.

BRIDGE RAILINGS
JAIL AND BANK WORK
GRILLS, ANDIRONS
SHUTTERS, DOORS, &C.

Railings, Gates, &c. for Residences and Public Institutions.

Special facilities for the manufacture of FORGED *and* PLANED *Wrought Iron Work for Interior Decorations.*

Send for Catalogue.



Union Spring Hinges

ARE

SIMPLE, EASILY SET,

CANNOT BE PUT ON WRONG.

They work either way, right or left. All sizes. Single or double acting.

For Wire Screens or Light Doors, they have no equal.

Send for Price List.

M. W. ROBINSON, Sole Agent, 79 Chambers St., New York

WALLIS IRON WORKS.

Manufacturers of the

PERKINS PATENT

Fire-Proof Double Iron Shutters & Doors

For Stores and Warehouses.

Tested and recommended by underwriters throughout the United States. Catalogue with reports of tests mailed on application.

7 to 11 Morris St., Jersey City, N. J.

SAMUEL J. CRESWELL,

IRON WORKS,

Twenty-third and Cherry Streets,

PHILADELPHIA, PENN.

Fronts for Buildings, Columns, Girders, Wrought-Iron Beams, Sidewalk Lights, Drinking-Fountains, Garden Vases, Stairs, Crestings, Stable Fixtures, Lamp-Posts, Railings.

J. G. & T. DIMOND,

Architectural Iron-Works.

ESTABLISHED 1852.

209 and 211 West 33d Street, New York City.

IRON

Buildings, Roofs, Fronts, Beams, Girders, Stairs, Columns, Railings, etc., etc.

Special attention given to ornamental Wrought-Iron Work.

THE

PHŒNIX IRON COMPANY,

410 Walnut St., Philadelphia, Pa.

Manufacture Rolled Beams, Channels Angles, Tee, Shape and Bar Iron of all sizes.

Roof Trusses, Girders, and Joists for fire-proof buildings framed and fitted as per plans.

PHŒNIX Wrought-Iron Columns of all sizes.

Die-forged Weldless Eyebars a specialty Designs and estimates furnished.

Boston Agents, FRED. A. HOUDLETTE & Co., 272 Franklin Street.

New York Agents, MILLIKEN & SMITH, 95 Liberty Street.

PENNSVLYANIA CONSTRUCTION CO.

Architectural Iron-Work,

Steel Jails, Vault-Doors, Roofs, Riveted Girders, Stairways, Bridges, Fencing, Iron Bedsteads and Cresting.

Offices: No. 132 First Avenue, PITTSBURGH, Penn.

NORTHROP'S
PATENT PANELED IRON CEILING.

DURABLE, HANDSOME AND FIRE-PROOF.

Will not stain or crack off as plaster, or warp and burn as wood.

NORTHROP'S PAT. CAP-SEAM IRON ROOFING. Over 3,500,000 square feet used in the past ten years. Suitable for all classes of buildings. Is never out of repair. Address, A. NORTHROP & Co., CORNER 23d and MARY STS., PITTSBURGH, PA.

NATIONAL

Fine Art Foundry,

218 East 25th Street, New York.

Artists' Models cast in Standard Bronze.

Architects' Designs Executed.

Artistic and Enduring Monuments in Granite and Bronze.

No Catalogues.

MAURICE J. POWER.

CARNEGIE BROS & Co.
LIMITED.
UNION IRON MILLS.
DEPARTMENT
BRANCH OFFICE, 33rd ST.
PITTSBURGH, PA.
MANUFACTURERS OF
WROUGHT IRON BEAMS,
CHANNELS, TEES, ANGLES,
STRUCTURAL & BRIDGE IRON.
LITHOGRAPH OF SECTIONS
AND BOOK OF DETAILED
INFORMATION FURNISHED
ENGINEERS AND ARCHITECTS
ON APPLICATION.

Iron-Work.

N.J. STEEL & IRON CO.
TRENTON, N.J.
ROLLED IRON BEAMS,
CHANNELS, ANGLES & TEES.
COOPER, HEWITT & CO.
NEW YORK.

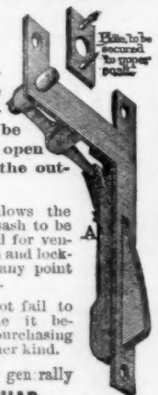
CHENEY & HEWLETT,
Architectural Iron Works.
Wrought and Cast Iron Work for Building Purposes.
N. Cheney. C. Hewlett. } OFFICE: { 201 BROADWAY, New York.
Works: Greenport, L. I.

MESKER & BRO.,
Galvanized Iron Cornices,
Window Caps and SKYLIGHTS.
Send for Catalogue.
421 to 429 South Sixth St., ST. LOUIS, MO.

Passaic Rolling Mill Co.
PATERSON, N. J.
SOLID ROLLED BEAMS,
Channels, Angles, Tees and Merchant Iron.
New York Office, Room 45, Astor House.

J. S. THORN,
ARCHITECTURAL
GALVANIZED IRON
and ORNAMENTAL CAST-ZINC WORKS.
Hayes Patent Ventilating Skylights (under license). Floor Lights, Vault Lights, Building Specialties and Builders' Light Iron-Work of every description.
Nos. 1201, 1203, 1205, 1207, 1209 Callowhill St., PHILADELPHIA, PA.

Farquhar's Improved
BURGLAR PROOF
Sash Lock.



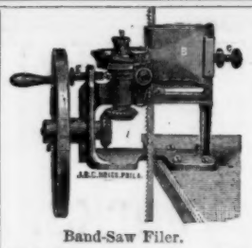
This new device is a perfectly secure lock for the window which cannot possibly be forced open from the outside.

Lock applied.

It allows the upper sash to be dropped for ventilation and locked at any point desired.

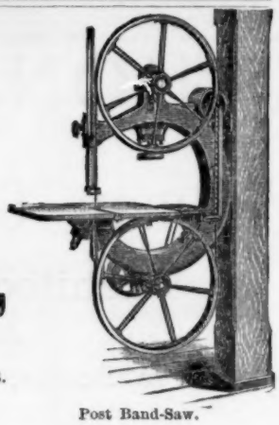
Do not fail to examine it before purchasing any other kind.

For Sale by Hardware Dealers generally
CHANDLER & FARQUHAR,
Manufacturing Agents,
168 DEVONSHIRE ST., BOSTON, MASS.
Kept in position by spring A.



Band-Saw Filer.

Band-Saw Setter.



Post Band-Saw.

Wood-Working Machinery,
FOR PLANING-MILLS, SASH, DOOR, AND BLIND FACTORIES, CABINET AND CARRIAGE MAKERS.
Send for Catalogue.

GOODELL & WATERS,
Philadelphia, Pa.
NEW YORK WAREROOMS, 115 LIBERTY ST., NEW YORK.

The "Climax" Rail for Sliding Doors.

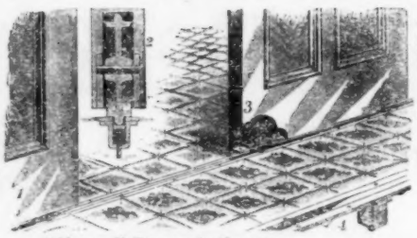


Figure 1 shows door open with centre rail level with floor. Figure 2, section of sheave, showing its position on rail. Figure 3 shows door closed with sheaves placed and centre rail depressed. Figure 4 shows track running off in the recess.

Construction simple and durable; applicable to old as well as new buildings. The door cannot jump the track.

Manufactured solely by
The "Climax" Rail Company,
NEW YORK.
Send for Price-List and Testimonials.

Address all Communications to
GEO. F. TAYLOR & WOOD, Business Managers, 134 Water St., New York.

Sanitary Appliances.

"Sanitas" (Anti-siphon) Trap

Without Ball Valve, or other obstruction to the water-way.

THE "SANITAS" PATENT
TRAP. WASH-BASIN. BATH-TUB. SINK. SOIL-PIPE. Etc.

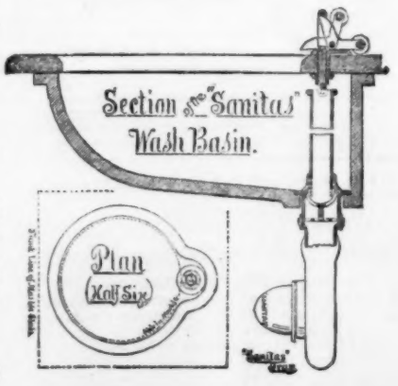
These are the appliances described in the "*American Architect*," for 1883, 1884, and 1885, in the articles on "*Sanitary Plumbing*," and denominated "Anti-Siphon Trap." "Stand-pipe Basin," etc.

Col. Waring, writing of the trap ("Putnam's Trap"), in the *Century* Magazine, for Dec., 1884, says he finds it "effective in withstanding siphonage and substantially self-cleansing," and adds,

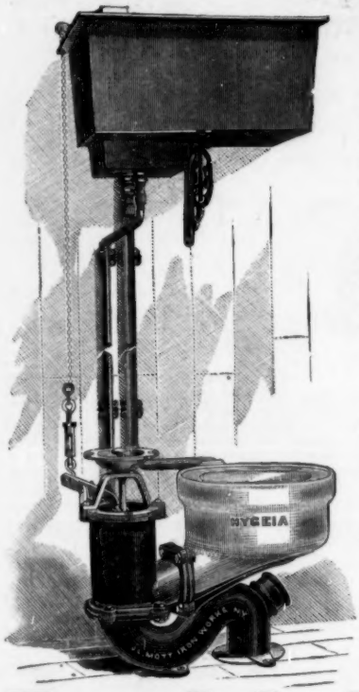
"IT SEEMS TO ME THE BEST TRAP I HAVE SEEN."

The Sanitas Wash-Basin, Bath-Tub, and Pantry-Sink, are quick emptying, without concealed passages. The Soil-pipe is cast of even thickness throughout, and jointed with steam and gas-tight joints. The "Sanitas" appliances are acknowledged by experts to be by far the best in the market.

FOR SALE BY ALL DEALERS IN PLUMBERS' SUPPLIES,
OR BY THE
SANITAS MANUF'G CO., 4 Pemberton Sq., Boston.



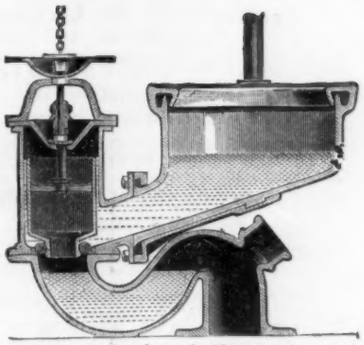
DEMAREST'S PATENT
Side-outlet, Flushing-rim, Cistern Water-Closet,
THE "HYGEIA."



We take great pleasure in calling the attention of all interested in sanitary matters to the "Hygeia." For perfect cleanliness and simplicity of construction we invite comparison with any cistern closet ever made, either of home or foreign manufacture. In short, we think as do those who have used this closet in all their fine work during the past two years, that it is *par excellence*, ahead of anything yet made in the way of a water-closet. The workmanship is of the very best kind, nothing being spared to make it a strictly first-class article in every respect, which, taken in connection with the very moderate price at which we sell it, cannot fail to place it ahead of all others in the market.

Complete Illustrated Circulars sent on application.

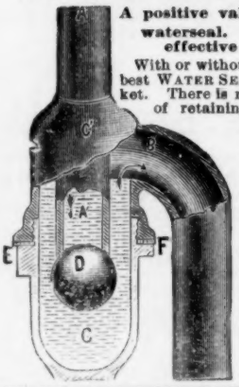
All our Sanitary Specialties are fitted up with water attached, and may be seen at our show-rooms.



The above section shows the Closet cut through the centre. All the iron-work above the trap (the trap we enamel to order) is enamelled, the Plunger and cover for Plunger section, also the Bridge and lever being galvanized and put together with brass bolts.

THE J. L. MOTT IRON WORKS,
88 and 90 BEEKMAN STREET, NEW YORK.

THE BOWER SEWER-GAS TRAP.



A positive valve Seal; a sound waterseal. Simple, cheap, effective and durable.

With or without the Valve, it is the best WATER SEAL TRAP in the market. There is no other Trap so sure of retaining its WATER SEAL. None that approximates it in the surety of the VALVE SEAL. The Valve keeps its seat by flotation, and as compared with other Valves in Traps, is little or no resistance to the outflow of water or waste. *Illustrative and descriptive 48-page pamphlet sent free on application.*

B. P. BOWER & CO.
Manufacturers,
CLEVELAND, O.

The Sanitary News.

HEALTHY HOMES AND HEALTHY LIVING.

A Weekly Journal of Sanitary Science.

Office of Publication: 113 ADAMS ST., CHICAGO, ILL.
European Office: 50 FINSBURY SQ., LONDON, E. C.

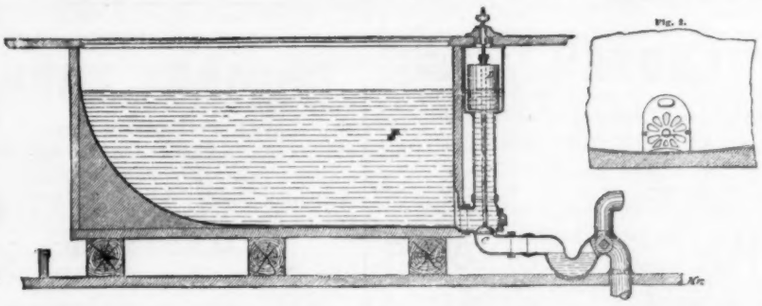
Yearly Subscription Rates: ***strictly in advance.***
In the United States and Canada. . $2.00
In Foreign Countries, ... 3.00

Advertising, $2.00 an inch.

PUT INTO THE WHITE HOUSE BY THE U. S. GOVERNMENT

F. E. CUDELL'S
Patent Sewer-Gas and Backwater Trap
—FOR—
Wash-Bowls, Sinks, Bath, and Wash-Tubs.
204 Superior St., Cleveland, O.

C. H. MOORE'S PATENT BATH TUB VALVE and BATH TUB.

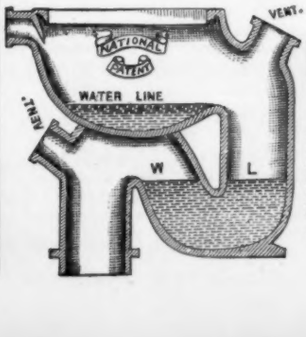


With the use of this Bath Valve the objectionable overflow pipe is not required, and the extreme end of the waste-pipe is closed with the solid brass valve C, thereby shutting out Sewer Gas to a certainty, and preventing the trap from becoming empty by syphonage or evaporation; and if water accumulates in the bath tub above the dotted lines shown, the float B lifts the valve C automatically, forming a channel for the surplus water to escape under the valve to the waste-pipe, which is much the safest plan as an overflow pipe either in a basin or bath tub is liable to become clogged, while the rest of the waste-pipe is free. The bath tub it will be observed, has the discharge outlet at the end instead of the bottom, which makes it handsomer in appearance than the old style, and decidedly more comfortable for use, and renders it convenient to place the waste pipe and trap connecting thereto above instead of beneath the floor and lead safe, which is now the universal custom. It will also be noticed the bath tub has an inclination from every part toward the valve C, so that every particle of water drains from it when the valve C is up and suspended by the pull that projects through the wood capping.

Fig. 2 shows the end of the bath tub and position of the strainer.

Manufactured by the WASHBURN & MOORE M'F'G. CO., Yonkers, N. Y.

N. B.—We furnish the tubs, if desired, fitted up complete with combination cock fed through the ordinary nozzle near the top of the tub or through a shield secured on the top of the end strainer. We also make Basin Valve and Water Closet on the same principle as the Bath Valve.



The "NATIONAL"
IMPROVED FLUSH, SIDE-OUTLET CLOSET.

ADVANTAGES: Simplicity, Cleanliness, Efficiency, Cheapness.

Being **all earthernware**, and requiring no metal fittings, which foul and get out of order, there are **no parts** in Basin and Trap where **filth can accumulate**; the Basin and Trap being left clean at **each flush. 25,000** have been sold since its introduction four **years** ago. **Prices are lower** than those of any other first-class closet claiming the same advantages. Made either complete in one piece, of earthernware or in two pieces with Basin and Trap separate. With or without seat-ventilator. Manufacturer: Thos. Twyford, Staffordshire, England.

Sole agent for the United States,
E. ASPINALL, 206 Pearl St., New York.

Building Stones.

THOMLINSON & REED,
Quarrymen, and Dealers in
OOLITIC LIMESTONE
Quarries at Avoca, near Bedford, Ind.,
Branch Office:
Cor. Polk and Ellsworth Sts., Chicago.

Dorchester, (New Brunswick.) Yellow.
FREESTONE.
Corsehill, (Scotch.) Red.
FREESTONE.
G. P. SHERWOOD. 24 Pine St., New York.

MALONE & CO.,
Proprietors of the
Malone Blue-Stone Quarries,
Miners and Manufacturers of
SAWED AND BLOCK STONE.
Platforms up to thirty feet in length, for sidewalks, a specialty. CLEVELAND, OHIO.

BEDFORD OOLITIC LIMESTONE,
Buff and Blue.
HALLOWELL GRANITE CO.,
Quarrymen and Dealers in
Building, Sawed, and Rough
DIMENSION STONE.
P. O. Address - - - Bedford, Ind.

Clark's Island Granite Quarries
OF ROCKLAND, ME.
Estimates given for **Building Dimensions** and **Monumental Work** in Granite, with extra facilities for dispatch and beauty of finish.
M. H. St. JOHN,
Owner and Proprietor.
Office: 83 and 84 Astor House, New York.

Cements.

STANDARD CEMENT CO.,
Manufacturers of
Hydraulic Cement
And Hydraulic Lime.
E. G. WESTCOTT, Gen. Eastern Agt., Hartford, Ct.
Works at
Akron, N. Y. St. Louis, Mo. Mankato, Minn.

HANOVER PORTLAND CEMENT
And the
Genuine Limmer Asphalt Mastic.
BAETJER & MEYERSTEIN,
5 Dey St., New York.

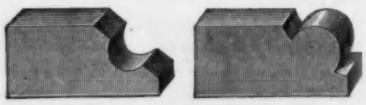
Best Brands of English and Continental
Portland Cements.
K. B. & S. English, Lafarge French,
Burham English, Lime of Teil,
Fewer German, Keene's Fine,
Jossan Antwerp, Keene's Coarse.
IMPORTED BY
JAMES BRAND, 85 BEEKMAN ST.,
NEW YORK.

SINCLAIR & BABSON,
IMPORTERS OF
PORTLAND CEMENT,
105 John St., New York.
Brands, O. F. ALSEN & SONS, and K. B. & S.
Remit 15 cts. for Practical Treatise on Cement.

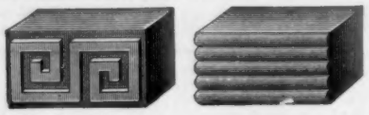
TRADE ★ MARK.
The "STAR" Portland Cement Works,
Toepffer, Grawitz & Co, Stettin, Germany.
ESTABLISHED 1860,
Guarantee their entire production (about 240,000 barrels a year) to have the following **Minimum-Tensile-Strength**, if tested according to the official German regulations, on non-absorptive beds:

		Minimum Breaking Strain.		
Neat "Star" Cement	7	40 kilos.	568.9 lbs.	per English square in.
do do	28	50 "	711.1 "	
1 Cement and 3 Standard Sand	7	15 "	213.3 "	
do do	28	20 "	284.4 "	
1 Cement and 6 Standard Sand	7	6 "	85.3 "	
do do	28	10 "	142.2 "	

Send for Testimonals, Pamphlet, Directions for Testing, etc.
Gustav Grawitz, 165 Broadway, N. Y., Sole Agent in the U. S.



BRICKS!
THE HYDRAULIC
PRESS BRICK CO.
ST LOUIS, MO.
Make a Specialty of Ornamental & Plain
Red Front Pressed Brick,
Manufacturing Annually over
TEN MILLIONS.
They guarantee that the **quality, finish** and **Color,** are unsurpassed, if **not unequalled** by any other bricks made in the United States.



TERRA-COTTA
CHIMNEY TOPS,
PHILADELPHIA
AND PEERLESS
(MOULDED) BRICK,
Akron Drain-Pipe. Portland, Roman, and Rosendale Cements. Hearth Tiles & Chimney Flue Lining.
WALDO BROS.,
88 Water Street, BOSTON.

WALPOLE MORTAR BLACK.
THE ORIGINAL.
The best in use and the only one that has stood the test of time. It improves the mortar, and is cheaper and better than Lampblack. **Beware of imitations and use only the "Walpole."**
HENRY D. DUPEE, Proprietor,
44 to 46 Oliver Street, Boston,
PROVIDENCE, R. I. Manchester & Hudson, Agents.
NEW YORK. Candle & Smith, foot E. 26th St. Ag'ts.

PEERLESS BRICKS.
THE PEERLESS BRICK COMPANY
OF PHILADELPHIA,
MANUFACTURES AND KEEPS IN STOCK
ARCHITECTURAL SHAPES, 300 KINDS.
ALSO
RED Pressed Fronts.
Extra fine in color and quality.
BUFF, Solid rich color,—beautiful.
One of the finest bricks made.
DRAB, Handsomer and more durable than stone.
BROWN, Very strong and superior to brown stone.
GRAY, A very desirable shade.
BLACK, Velvety jet face.
The only black brick fit for a fine building, producing a beautiful effect, and free from the glossy and greasy look of other black or dipped bricks.
DIAPERING and ORNAMENTAL
Bricks made in the above colors.
ARCHES OF ALL KINDS.
1003 WALNUT STREET, Philadelphia.
SAMUEL HART, PRESIDENT. JOSEPH WOOD, JR., TREASURER.
THE PEERLESS BRICK COMPANY
Wish to inform Architects and Dealers that no one is authorized to act as Agent for the sale of our manufactures.
Illustrated Catalogue and Price-List sent free on application.

EXCELSIOR BRICK & STONE COMPANY,
PHILADELPHIA, PA.
Manufacturers of
Hand-Made Red Pressed Bricks,
Carrying One Million in Stock.
OFFICE, 140 SOUTH FOURTH STREET.

JAMES H. BEGGS & CO.,
Wilmington, Delaware, Terra-Cotta and Ornamental Brick Works,
WILMINGTON, DEL.
Brick and Terra-Cotta furnished from any Design. Bricks for Arches ground to suit any Radius. Equal in Quality and Color to Philadelphia Brick.

AUGT. T. CHUR,
Room 14, 5th story, Mills Building, N. York
Importer of
"WILCOCK'S" Enamelled Bricks,
Impervious to any atmospheric effect, and may be used with perfect safety in the face of moisture and frost.

Keep Your Walls Dry.
A New Cornice Gutter,
In Wood or Metal, set on furs, with a space behind for over-flow water.

Patented May 12, 1885,
BY
DUDLEY NEWTON,
ARCHITECT,
Bellevue Ave., Newport, R. I.
Permits to use on any building can be obtained on payment of a royalty for each. Apply to the Patentee.
Infringements Prosecuted.

HELIOTYPE.

Photo-Mechanical Printing.—For the reproduction in printer's ink, on the printing-press, of Portraits and Views from Nature and all descriptions of PHOTOGRAPHIC work.

Photo-Lithography.—For the reproduction of Artists', Architects', Engineers', Surveyors', and other Drawings from originals in black and white.

Photo-Engraving and Zinc Etching.—For the production of cuts to print with type, from originals in black and white.

Photo-Caustic Printing.—For the lithographic reproduction of photographic subjects, without redrawing.

Lithography.
Chromo-Lithography. Of all classes.

Direct Transfer.—A patented process for the speedy reproduction (from originals made with ordinary ink on ordinary paper) of autograph letters, sketches, caricatures, etc., either as cuts or lithographs.

The Heliotype Printing Company, 211 Tremont Street, Boston, Mass.

Fire-proof Building.

THE WIGHT FIRE-PROOFING COMPANY,

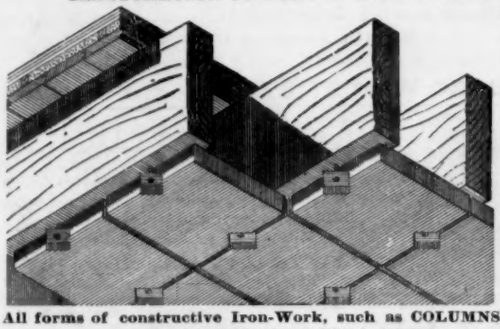
202 La Salle St., CHICAGO, **69 Washington St., NEW YORK.**

CONTRACTORS FOR ALL KINDS OF FIRE-PROOF WORK IN

Porous Terra-Cotta and Hollow Fire-Clay Tiles

IN ALL PARTS OF THE UNITED STATES.

ILLUSTRATION OF POROUS TERRA-COTTA FIRE-PROOF CEILING.



500000 feet of this ceiling have been put up in Chicago, Milwaukee and Cleveland, and it is now being put in the American Bank-Note building, New York.

Patented April 16, 1878, and March 6, 1883.

Top of Ceiling Tile.

Bottom of Ceiling Tile

All forms of constructive Iron-Work, such as COLUMNS, GIRDERS, and ROOF TRUSSES covered with POROUS TERRA-COTTA and left ready for plastering. Partitions, Furring and Roofing Furnished and Set.

FIRE-PROOF BUILDING MATERIALS.

Raritan Hollow and Porous Brick Company,

EDWARD KEASBEY, Pres't. J. C. ROSSI, Sup't. H. M. KEASBEY, Sec. and Treas.

Manufacturers of Hollow Burnt-Clay Bricks and Porous Terra-Cotta Bricks,

For Floors, Ceilings, Partitions, Furring, Roof-Lining, Column Fire-Proofing, etc.

Offices, 115 Broadway, New York, and 249 South 6th St., Philadelphia.

Agents: **FISKE & COLEMAN**, Boston. **GARFIELD, FERTIG & CO.**, Allegheny, Pa.

☞ Estimates Furnished. Builders Supplied. Send for Illustrated Catalogue. 81

GEO. M. MOULTON, Pres't. A. T. GRIFFIN, Vice Pres't. E. V. JOHNSON, Sec'y., Treas. and Gen'l. Man'g'r.

FIRE-PROOF HOLLOW BUILDING TILE

Fire-Proof protection for Iron and Wood Columns and Girders. Special designs on application.

FOR THE INTERIOR
CONSTRUCTION OF BUILDINGS,

Great strength, combined with saving in space, and weight, is obtained by the use of our system of

Hollow Tile Floors, Partition Walls, Roofs, Ceilings, Etc.

Contracts taken for the erection of HOLLOW, SOLID and POROUS TILE-WORK in any part of the United States.

PIONEER FIRE-PROOF CONSTRUCTION CO.,
1545 CLARK STREET, CHICAGO.
Formerly THE OTTAWA TILE CO.,
MANUFACTURERS AND CONTRACTORS,
Dealers in every description of constructive Tile for Building Purposes.

Send for our descriptive Catalogue, giving full explanations, advantages, references, etc.

ISAAC M. HOLCOMB, President. CHARLES E. STREAT, Secretary.

Established 1873.

THE FIRE-PROOF BUILDING COMPANY,

OF NEW JERSEY.

MANUFACTURERS OF FIRE-PROOF BUILDING MATERIALS.

Porous Terra-Cotta Blocks, Hollow Burnt-Clay Bricks and Tell Lime Composition Blocks.
For Arches, Partitions, Furring, Deafening, Roofing, etc.

BUILDERS SUPPLIED.

Office, 229 BROADWAY, (Rooms 12, 13 and 14,) NEW YORK, N. Y.

ESTABLISHED 1856.

HENRY MAURER, Manufacturer of

Fire-Proof Material

Of every description. Hollow Brick made of Clay for Flat Arches, Partitions, Furring, etc. Porous Terra-Cotta, Fire-Brick, etc., etc.

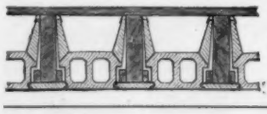
Works, PERTH AMBOY, N. J. **Office and Depot, 420 EAST 23d STREET, New York.**

LYONS' PATENT FIRE-PROOF

BUILDING MATERIAL,

FRANK LYONS, JR., Sole Manufacturer.

Office Room 60, Drexel Building, Cor. Wall and Broad Sts. Works, Nos. 57 to 65 Clason Ave., Brooklyn. New York Telephone, New 387. Brooklyn Telephone, Williamsburg, 391. Mechanics and Traders' Exchange, No. 14 Vesey St. (Box 82).



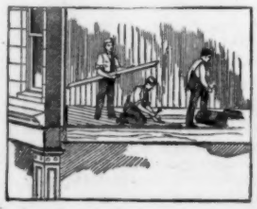
FIRE-PROOF FOR WOODEN BEAMS.

Patented August 8, 1882.

Fire-Proof Tiles for Arches, Partitions, and Furring. Also, Tiles for Protecting Wooden-Floor Beams against Fire.

Artificial Stone and Rock Asphalt pavements.

JOHN J. SCHILLINGER, 420 East 92d Street, NEW YORK.



Asbestos Flooring Felt.

Patented August 20, 1872.

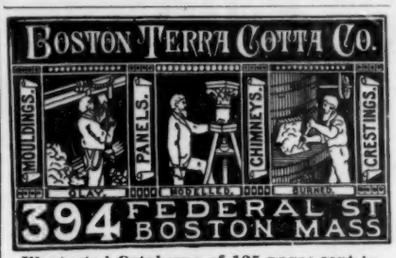
For Lining between Floors, under Slates, Shingles, Clapboards, etc.

Absolutely fire-proof, and unexcelled for deadening purposes. In rolls 44 inches wide. Manufactured only by

THE ASBESTOS PACKING CO.,

Offices: 169 CONGRESS STREET, BOSTON. 33 JOHN STREET NEW YORK.

Terra-Cotta.



Illustrated Catalogue of 125 pages sent to ARCHITECTS, BUILDERS and OWNERS,

upon application accompanied by business card.

INDIANAPOLIS

TERRA-COTTA CO.

INDIANAPOLIS, IND.

Manufacturers of

Architectural Terra-Cotta.

Send for estimates.

BALTIMORE

TERRA-COTTA CO.

Office: 30 Columbia St., Baltimore, Md.

MANUFACTURERS OF

ARCHITECTURAL TERRA-COTTA

MOULDED AND PRESSED BRICK.

PERTH AMBOY

TERRA-COTTA CO.

Nos. 80 and 81 Astor House, New York.

MANUFACTURERS OF

ARCHITECTURAL TERRA-COTTA.

BUFF AND COLORED BRICK, FIRE BRICK.

A. HALL

TERRA-COTTA CO.

Architectural Terra-Cotta, Fire-Brick, Furnace-Blocks, &c.

MOULDED, BUFF, AND COLORED BUILDING BRICK.

Perth Amboy, N. J.

Northwestern Terra-Cotta Works.

TRUE, BRUNKHORST & CO.,

ARCHITECTURAL

TERRA - COTTA.

Works: Corner Clybourn & Wrightwood Aves. **Chicago.** **City Office:** Room 20, McCormick Block

Formerly Cor. W. 15th and Laflin Sts.

Estimates given on application. Send for latest Catalogue, Price-List and Samples.

ORRIN D. PERSON,

123 5th Avenue, New York.

AKRON VITRIFIED ROOFING-TILE,

Finials, Ridge Cresting and Hip-Rolls.

Architectural Terra-Cotta.

Encaustic Glazed and Plain Tiles,

For Floors, Hearths and Decorations.

Enamelled Bricks, A large variety of colors on hand.

A PERFECT FIRE-PROOFING

Corrugated Wire-Lathing.

A metallic plastering surface, which permits of a continuous key, without furring of any kind. Can be applied by an ordinary mechanic, needs no stretching, and is simply fastened to the beams or studding by staples driven through the corrugations. This is the best support for deafening known, and insures a perfect protection for Iron Girders and Columns, as well as all wood construction. Delivered in flat sheets, 3' x 8'. Illustrated circular and information at

Room 14, 239 Broadway, New York City.

The Stanley Corrugated Fire-Proof Lathing Company

WM. H. JACKSON & CO. 31 E. 17th St. New York.

North Side
Union Square,
2d door from
BROADWAY.

Established, 1827.

Designers and Manufacturers
OF
Grates, Fenders
— AND —
Chimney-Piece
Appurtenances.
In fact everything pertaining to Open Fireplaces.
Importers of Tile.
Foundries and Shops,
East 28th & East 29th Sts.
Fine Castings a Specialty.

FINE HAMMERED
Metal Work
Of every description and finish for Interiors.

PRIZE MEDALLISTS.

Exhibitions of 1862, 1865, 1867, 1872, 1873, and only Award and Medal for Noiseless, Self-Coiling Steel Shutters at Philadelphia, 1876; Paris, 1878; and Melbourne, 1881.

CLARK, BUNNETT & CO. (Limited)

Late CLARK & COMPANY,

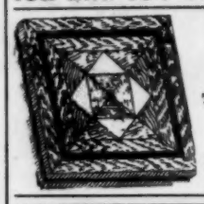
Original Inventors and Sole Patentees of Noiseless

Self-Coiling, Revolving **STEEL SHUTTERS** Fire & Burglar Proof.

Also, ***Improved Rolling Wood Shutters,*** and ***Clark's Patent Metallic Venetian Blinds.***

The BEST in the Market. Send for Catalogues, etc., to

162 and 164 West 27th St. - - New York.



PARQUET FLOORS.

WM. HANNAM & CO.

7-8 inch tongued and grooved, European Styles, Solid and Substantial Also 3-8 inch Fancy Wood Carpet Floors.

293 FIFTH AVENUE, NEW YORK.
Wholesale and Retail.

PARQUET FLOORS.

The National Wood Manufacturing Co.,
41 & 16 East 18th St., New York.
REMOVED to 129 5th AVE.
INLAID WOOD FLOORS, 5-16 and 7-8 inch thick.
Designs and estimates on application. Established 1867.

FINE LOCKS

FOR ALL PURPOSES.

"Yale" and "Standard."

Catalogues on application.

The YALE & TOWNE MANUFACTURING CO., STAMFORD, CONN.

62 Reade St., New York. | 15 N. Sixth St., Philadelphia.
224 Franklin St., Boston. | 64 Lake St., Chicago.

BUNDY

RADIATORS.

Moule's Earth-Closet.

MYERS All China Water-Closet In one piece with Trap combined.

DECECO Siphon Water-Closet and large Stock **PLUMBERS' SUPPLIES.**

MYERS SANITARY DEPOT,
94 Beekman St., New York.

AMERICAN AND GEM
SPRING HINGES.

Bronze, Brass & Iron,
In Various Styles, and SUPERIOR Finish.
Send for Catalogue.
VAN WAGONER & WILLIAMS CO.,
82 Beekman St., N. Y.

Established 1857.

The GREAT CHURCH LIGHT

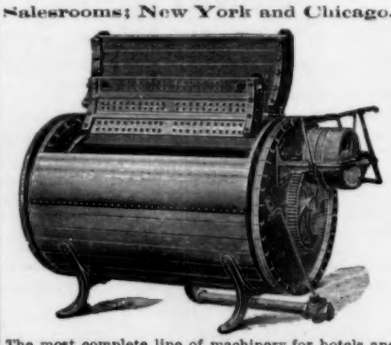
FRINK'S Patent Reflectors for Gas or Oil, give the most **powerful, softest cheapest & Best** light known for Churches, Stores, Show Windows, Banks, Theatres, Depots, etc. New and elegant designs. Send size of room. Get circular and estimate. A Liberal discount to churches and the trade. *Don't be deceived by cheap imitations.*
I. P. FRINK, 551 Pearl St., N. Y.

[Established 1865.]
Scenery for Theatres, Public Halls and Amateurs.
Lafayette W. Seavey, 8 Lafayette Place, N. Y.

Bailey's Compound Silver-Plated Corrugated Glass
REFLECTORS!!
A wonderful invention for lighting Churches, Opera Houses, Halls, Storerooms, etc. Latest and handsomest designs. **Satisfaction guaranteed.** Plainer styles for manufactories. Send for Illustrated Catalogue and Price-List. **For Gas or Oil.**
BAILEY REFLECTOR CO.,
113 Wood Street, Pittsburgh, Pa.

Troy Laundry Machinery Co.,

LIMITED. TROY, N. Y.
Salesrooms: New York and Chicago.



The most complete line of machinery for hotels and Public Institutions. Complete laundries for Institutions our specialty.
Estimates furnished. Send for Illustrated Catalogue.

"Giant Metal Sash Chain."

MADE ONLY BY
THE SMITH & EGGE MANUFACTURING CO.,
BRIDGEPORT, CONN.

The most reliable and economical article in the market for the purpose. GREAT TENSILE STRENGTH Does not corrode; does not lose its vitality by continuous use, or exposure to the elements; runs over any pulley, and gives satisfaction wherever it is used. Fixtures made of steel wire, is very simple and easily applied. Prices very low. Samples sent to any architect in the United States, free, on application. Now in use in State House, Hartford; Providence City Hall; Singer Building, Chicago; J. C. Flood's, Menlo Park, Cal.; Vanderbilt and Florence Flats, New York; Boreel Building, New York; new State War and Navy Departments, and Patent Office, Washington, D. C.; *Herald* Building, Boston, and very many other fine buildings in all parts of the United States.

SAYLOR'S PORTLAND CEMENT.

Strongest, Cheapest, Best, and Always Fresh.
JOHNSON & WILSON, Gen. Agts.,
For Sale by all dealers in masons' materials. **91 Liberty Street, New York.**
Sole Agents for **Styrian Tool Steel,** for the United States and Canada.
Send for New Descriptive Pamphlet.

ARTISTIC GRATES AND FENDERS.

OPEN FIREPLACES.
Direct Importers and Dealers in
Foreign and Domestic Tile
of every description and make, including new and original designs solely our own.
Fire Irons, Andirons, Brass Plaques, Jardinieres, &c.
The largest assortment and most elegant show-rooms America.
J. S. CONOVER & CO.,
28 and 30 West 23d Street, - - New York.

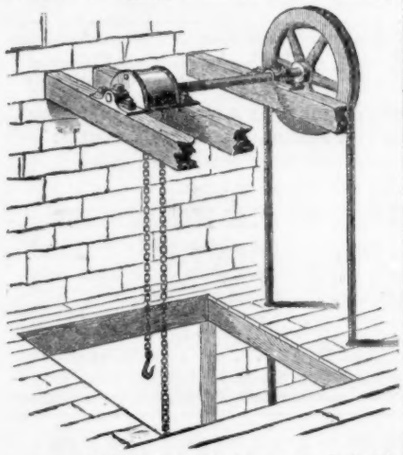
The American Architect and Building News

ADVERTISERS' TRADE SUPPLEMENT.

No. 37. SATURDAY, JULY 4, 1885. Volume XVIII. No. 497.

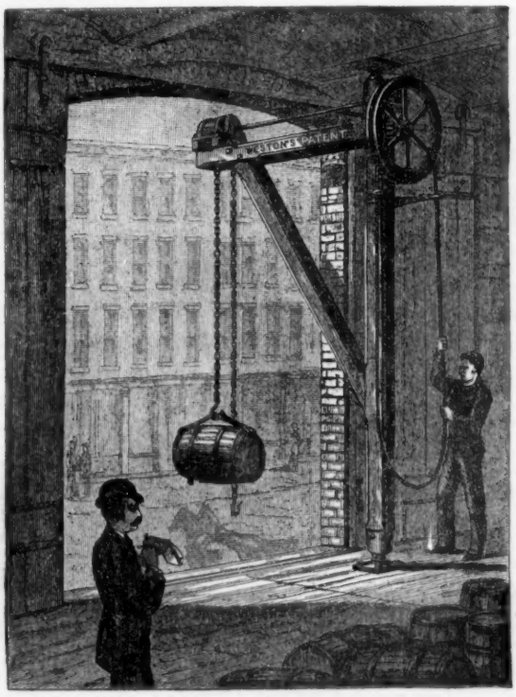
THE WESTON PATENT SAFETY DOUBLE-LIFT HOIST.

It is often a problem in stores, warehouses, and in many private houses, how to convey loads to the upper stories. A safe and convenient hoisting apparatus is a necessity in any



business building, and it is a very desirable feature in houses of any size. In cases where the expense of a power elevator is not warranted, a good hand-power machine is a very convenient substitute. We illustrate herewith one of the Weston Patent Safety Double-Lift Hoists, which combines many desirable features for a hand machine. Its most important feature is its entire safety, as it will hold the load suspended at any point, it being necessary to pull the hoisting-rope in the reverse direction in order to lower. There is thus no possibility of the load running away, thus endangering the occupants of the building and rendering the property liable to damage also. Another very desirable feature is that the hoisting-chain is provided with a hook at each end, so that there is always one hook ready to receive a load. The machine is perfectly simple, and is durable, and is sold at a reasonable price. The first illustration shows the Lift as adapted to a hatchway; but it is also very desirable when placed upon a light jib-crane, as shown in the second illustration. It is evident that this may be very useful in unloading goods from trucks, cars, etc., which may be alongside the building. The machine is also made in portable form, and in all capacities from five hundred pounds to two thousand pounds. We are the manufacturers of these articles, and will be glad to furnish illustrated catalogues, price-lists, and any information desired.

YALE & TOWNE MANUFACTURING CO.,
STAMFORD, CONN.



ROOFING TIN AS MADE FIFTY YEARS AGO.

For the past ten years the quality of Roofing Tin has been getting gradually poorer and poorer, and many of the old brands that could always be relied upon have caused frequent complaints on account of their inferior coating and quality of iron. The former is on account of the Patent-Rolled System, by which most of the metal that would adhere to the iron is squeezed off by passing through rolls that revolve at the top of the melting pot, and through which the sheet must pass. You therefore get the appearance, and not the plate as it should be made.

This deterioration of quality caused us some years ago to have a Roofing Tin made of both the finest quality iron and coating in the old-fashioned way, whereby each sheet is dipped separately by hand in a pot of metal and then placed on a rack to cool. In this way the sheet is dipped twice and contains all the metal possible.

The brand is Taylor's Old Style, re-dipped or double-coated, with registered trade-mark on every box.

It is made by the Copper Miners' Tin Plate Co., of Taibach, Glamorganshire, Wales, one of the very oldest works in existence, and we take the whole production of this brand.

We guarantee every sheet to be of Best Charcoal Bloom Iron, covered with all the metal it will hold.

The price is very little more than the common brands and less than the old M. F. brand — making it intrinsically the cheapest plate in the market. There are many imitations of inferior quality iron with extra coating, but if the iron breaks, of what use is the coating, which will also break?

We guarantee the quality in every particular.

"Westminster," re-dipped by the old method or old process, is intended to supply any demand for a little less coating than the genuine "Old Style," but retains all the other characteristics of this fine brand, and is offered to the trade at its real value. It is guaranteed to contain more metal in its coating than the many imitations of the genuine Old Style, and is, therefore, entitled to that confidence which is lacking in them.

N. & G. TAYLOR CO.,
PHILADELPHIA, PA.

SKYLIGHT LITIGATION.

NEW YORK, June 16, 1885.

We beg to notify you that George Hayes has recently brought a suit against us, in which he charges that the Bars and Rafters of the Skylights made by us, infringe on one of his patents. Hayes made a motion, in that suit, through his counsel, Livingston Giffard, that a preliminary injunction issue, restraining us from making, using or selling any bars or rafters. This motion was argued in the United States Circuit Court, before Judge Wheeler, and, *we are pleased to say, that it has been decided in our favor.*

We are at perfect liberty to supply the trade with our Skylights containing our Patented Bars or Rafters, the same as we have done in the past, and our customers may deal with us, without fear of interfering with, or infringing upon the rights of any one. We are ready to show you a copy of Judge Wheeler's opinion. This notice will satisfy the trade that the circulars issued by George Hayes, in which he slanders our reputation are not worthy of consideration, and cannot affect our standing in the trade. Among the contracts we have is the Second Avenue Railroad Depot, the largest skylight is 14′ x 94′. We are

shipping all over the United States, to places where we have no manufacturing agents.

BICKELHOUPT BROS.,
218 West Thirty-Seventh St.

Cincinnati, June 19, 1885.

We have the pleasure to announce that this Company, having entered its exhibit for competition, is awarded the Gold Medal of the First Class for "Corrugated Iron for Building Purposes," by the World's Industrial and Cotton Centennial Exposition, at New Orleans.

THE CINCINNATI CORRUGATING CO.,
J. G. Battelle, Secretary.

Established 1851.

BUILDING PAPERS

Of Every Description always in Stock.

Red Manilla Building Paper.
Rosin-Sized Sheathing.
Deadening Felts.
Tarred Felt for Roofing and Sheathing.
Also, an Extra Dry Felt for Carpenters' and Slaters' Use.
Ready Roofing, 2 and 3 ply.
Roof Coating, Pitch.
Black Varnish for Iron-Work.
Tin Caps, Nails, Etc.

SEND FOR SAMPLES AND PRICES TO

C. S. GARRETT & SON,
PAPER MANUFACTURERS,
12 and 14 Decatur St., Philadelphia.

Window Blind Worker

Opens and closes the blinds without raising the window. Blinds held firm in any position. Perfect in operation; so constructed that neither ice, frost nor rust affect them.

DODD & RICE M'F'G CO., Hudson, N. Y.

ESTERBROOK'S STEEL PENS

FOR SALE BY ALL STATIONERS.
THE ESTERBROOK STEEL PEN CO.
20 John Street, New York, N. Y.

Cornell University.

DEPARTMENT OF

Architecture,
Civil Engineering,
Mechanic Arts.

The course in Architecture embraces the necessary scientific and mathematical studies, the history of the art, and constant practice in drawing and designing.

Persons 21 years of age, properly qualified, are received as special students, without the usual entrance examinations. For copies of the Register, giving full information, address the

TREASURER OF CORNELL UNIVERSITY, ITHACA, N. Y.

BEAUTIFY THE HOUSE.

The Decorator and Furnisher.

The new illustrated practical art magazine of 40 pages (Harper's Weekly size) treating of the

Furnishing and Decorating of the Interior of the House.

With Practical Directions and Hints and Suggestions and Original Designs for all manner of Home Architecture embracing,

Furnishing of Rooms, Draperies, Wall Decoration, Wood-Carving, Ceramics, Stained-Glass.

The Reading Matter and Designs will be from the

Distinguished Writers and Architects

of this country and Europe.

Magnificent colored plates for Ceiling Decoration.

Subscription, $4.00 per year. Single copies 35 cents.

Trial subscription for three months, one dollar.

The Decorator and Furnisher Co.,
30 and 32 East 14th St., New York City.

MASSACHUSETTS INSTITUTE OF TECHNOLOGY.

BOSTON, MASS.

This school offers a four year's scientific and professional training in Civil, Mechanical, Mining and Electrical Engineering, Chemistry, Natural History, etc.

THE COURSE IN ARCHITECTURE

embraces, besides the necessary scientific and mathematical subjects, the study of architectural history, and the constant practice of original design.

Students in Architecture are received into a two year's special course.

Francis A. Walker, Prest. J. P. Munroe, Sec'y

H. A. STREETER'S

Patent Solid Muntin

Metallic Window-Sash

For Fire-proof Buildings, Insane Asylums, Prisons, etc., etc.

Light, strong and durable. Fire and burglar proof. Best, cheapest and neatest form of fire-proof sash now in use. Used in the State Insane Asylum, Kankakee, Ill., Major Willett, Architect, Chicago; Insane Asylum, St. Joseph, Mo., Col. S. V. Shipman, Architect, Chicago; Cook Co. Insane Asylum, Jefferson, Ill., Egan & Hill, Architects, Chicago.

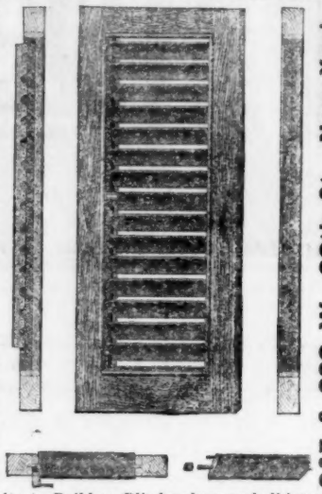
Manufactured by GLOBE IRON WORKS,

H. A. STREETER, Proprietor,
35 to 41 Indiana Street, Chicago, Ill.

Acme Window-Blind.

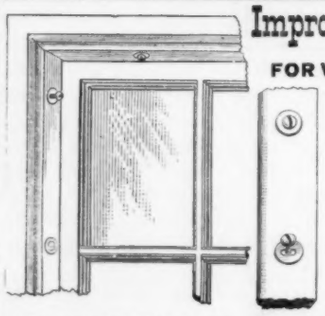
MORSTATT & KLATZL,

Patentees and Sole Manufacturers,



227 & 229 W. 29th St., New York.

Architects, Builders, Blind-makers, and all interested in building should send for Illustrated Circular. The Acme Blind is the only Blind that is giving entire satisfaction. For State-rights, estimates, and further particulars, Address **MORSTATT & KLATZL,**
227 & 229 West 29th Street, New York.



Showing Adjustable Stop Bead.

Improved Stud—Socket with Screw.

PATENT APPLIED FOR.

FOR WINDOW STOP BEADS & OTHER PURPOSES.

EASILY APPLIED! CHEAP! DURABLE!

One half turn of the Screws render Stop Beads Adjustable to the Sash.

THE DIFFICULTIES EXPERIENCED

in using unseasoned wood entirely remedied. Architects and Builders should at once send for Illustrated Price List and Sample.

C. R. NELSON,

Address P. O. Box 2771. Sole Manufacturer.

Office & Factory, 108 Liberty St., New York City.

NATURAL WOOD FINISHING.

Good taste and artistic appreciation demand the preservation of Nature's colors in finishing the interior wood-work of your house, therefore, use only

BERRY BROTHERS'

HARD OIL FINISH,

which preserves, heightens, and brings out the natural color of all woods. For the interior wood-work of *public buildings* and *private houses* this article has never been equalled, always maintaining its standard character amid the many so-called imitations its success has brought upon the market. See that every package bears our brand or label. Samples finished wood furnished on application.

BERRY BROTHERS, Varnish Manufactur's, Detroit.

For outside doors use Berry Brothers' "ELASTIC OUTSIDE FINISH."

MURPHY & COMPANY

TRANSPARENT WOOD FINISH.

Call the attention of Architects and Builders to the following grades of Varnish.

INTERIOR, $2.50 per gallon.

For interiors, on painted surfaces or plain wood. Peculiarly adapted for Hallways, Bath-rooms, Kitchens, etc., and for Floors, Walls, Ceilings in Asylums, Hospitals and Public Buildings. Its lustre is unaffected by hot or cold water, or extremes of temperature, or by the action of soap, grease, or gases.

EXTERIOR, $4.00 per gallon.

Possessing all the qualities of the **"Interior,"** as above, but having greater durability. Intended for outer Doors and Sashes, Vestibules, and surfaces where the exposure to the elements is constant or severe. **It is an absolute preventive of dry-rot and moisture.**

In addition to the above-mentioned products, and to their popular and unequalled fine carriage and railway varnishes, MURPHY & CO. ask attention to their superior Fine House Varnishes, especially adapted to interior and exterior work on public buildings, churches, office-buildings, business blocks, office, and private residences. Further information and samples for trial furnished to parties interested. These grades are manufactured solely by

MURPHY & COMPANY, Varnish Makers,
227 Broadway, NEW YORK.
ST. LOUIS, 300 So. Fourth St. CLEVELAND, 566 Canal St. CHICAGO, 262 Wabash Avenue.

DYCKERHOFF'S
PORTLAND CEMENT

Is superior to any other Portland Cement made. It is very finely ground, always uniform and reliable, and of such extraordinary strength, that it will permit the addition of 25 per cent more sand, etc., than other well-known Portland Cements, and produce the most durable work. It is unalterable in volume and not liable to crack. 6,000 barrels have been used in the foundations of the Bartholdi Statue of Liberty, and it has also been used in the construction of the Washington Monument at Washington. Circular with Testimonials and Tests sent on application.

E. THIELE, 78 William St., New York,

SOLE AGENT FOR THE UNITED STATES.

NEW ENGLAND

Felt Roofing Co.

22 Milk St., Boston.

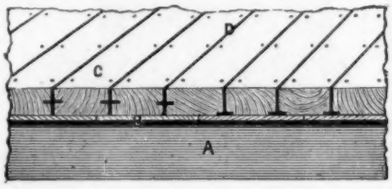
Originators of **Felt Roofing** in New England.

Inventors and only Manufacturers of the Celebrated

"BEEHIVE BRAND."

DOLBEARE'S
Water-Tight Wood Floors.

Architects and Builders will find in Dolbeare's Water-Tight Wood Floors an improvement long sought for, combining lightness, durability, and absolute water-tight qualities. For horse-car, livery, and private stables, it is rapidly taking the place of caulking or concreting. For slaughter-houses, currier's shops, factory floors, bridges, etc., it is highly recommended. In first-class stores, hotels, and public buildings, by the use of this floor it is absolutely impossible for goods or ceilings to be damaged by water leaking through the floor in case of fire, bursting of water-pipes, etc.



Patented June, 1882.

In the above cut an end or sectional view is shown, B representing a 7-8 matched boarding on Floor Timber, A, C showing a 3-inch planking with 3-8 Rabbetting or Groving (this can be laid in thickness from 1 inch, upwards), and D showing the Filling in the seams, applied hot, which, when set, is thoroughly adhesive to the wood and sufficiently elastic to allow for any ordinary shrinking, swelling or settling.

Orders respectfully solicited, and personally attended to, by addressing

W. L. DOLBEARE,

No. 522 Atlantic Avenue, Boston.

MIDDLESEX HORSE RAILROAD COMPANY.

BOSTON, June 14, 1882.

W. L. DOLBEARE, Esq.

Dear Sir:—It affords us pleasure to recommend your process for "Making Floors Absolutely Water-Tight." In our new Bunker-Hill Stable, where we have stalls on three floors (one directly over the other), it has given the most perfect satisfaction, and makes no extra strain upon the walls of the building, as would be the case if the old method of "Caulking" was resorted to. In very many respects I regard your floor as very much superior to any caulked floor. Very truly, CHARLES E. POWERS, Pres.

SAMUEL D. KELLEY, ARCHITECT.

BOSTON, June 21, 1882.

W. L. DOLBEARE, Esq.

Dear Sir:—I have used Dolbeare's Improved Water-Tight Wood Floors for stable purposes to the extent of about fourteen thousand (14,000) square feet, and they have given complete satisfaction. I consider it superior to caulking or other Improved Water-Tight Floors. Yours, &c.,

SAMUEL D. KELLEY.

CHICAGO

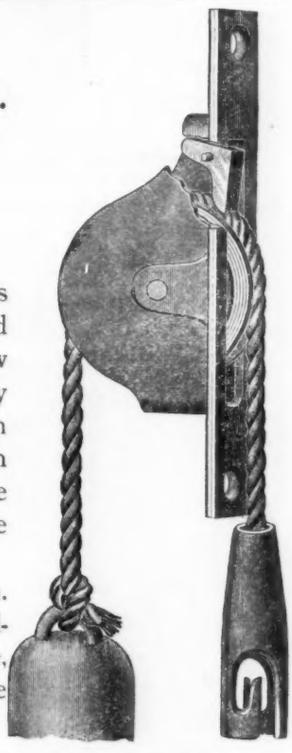
Window Improvement Co.

196 Jackson Street. Telephone 336.

TO CONTRACTORS.

The old adage, that a dollar saved is as good as two dollars earned, will hold good by your using the Chicago Window Improved or Weight Suspending Pulley and Sash-Cord Fastener, by the use of which one man can do the work of two, and can hang three windows with them where he could only hang one with the old style pulley.

This fact should enlist your attention. They can be found at the principal hardware stores, or at the Company's office, 196 Jackson Street, Chicago. Telephone No. 336.



BRASS FEET

FOR

Chairs and Tables.

MANUFACTURED BY

J. B. SHANNON & SONS,

1020 Market Street, PHILADELPHIA, PA.

Write for Illustrated Price-List.

A. G. NEWMAN, late NEWMAN & CAPRON.

MANUFACTURERS OF

Fine Bronze Hardware, Bank, Office and Shop Railings in Bronze or Brass. Antique Furniture-Trimmings. Electrical and Mechanical Bell-Hanging Burglar-Alarms.

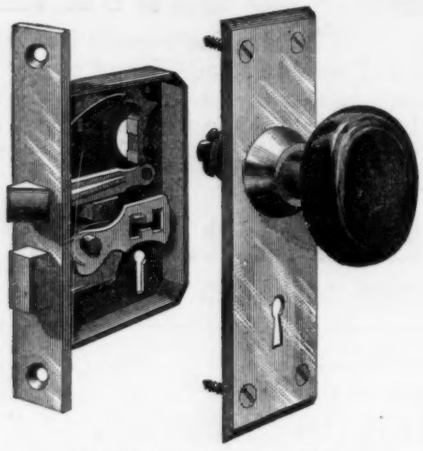
Warerooms, 1180 BROADWAY. Factory, 157-163 WEST 29th STREET, NEW YORK, N. Y.

Niles's Patent Locks and Knobs.

Acknowledged by all who have used them to be superior to all others.

NO LOST MOTION. NO HUB TO BREAK.
NO KNOB-SCREWS OR WASHERS. MOST QUICKLY APPLIED.

☞ ADAPTED FOR ALL DOORS FROM 1 1-4 INCH AND OVER. ☜



For Prices and Particulars address,

BUTLER & CONSTANT.

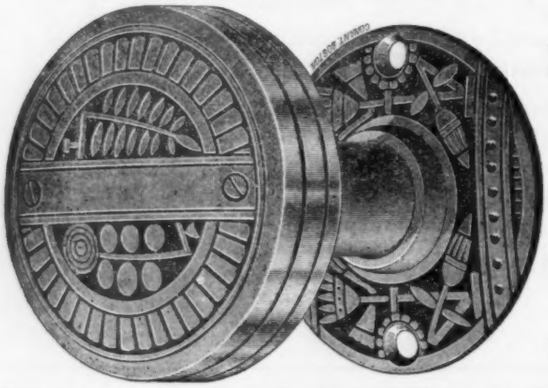
Dealers in Builder's Hardware. Agents for New York and vicinity.

18 Warren Street, New York.

AGENTS FOR CANNON'S PATENT DUMB WAITERS.

NASHUA LOCK CO.,

NASHUA, N. H.



MANUFACTURERS OF

Builders' Hardware,

FINE CASTINGS

—IN—

Bronze, Brass, & Iron.

Full Line of Samples and Goods may be found at

36 Pearl St., Boston, and 148 Lake St., Chicago, Ill.

NATURAL WOOD ORNAMENTS,

—FOR—

ARCHITECTS, HOUSE BUILDERS,
INTERIOR DECORATORS,
WOOD MANTLE MANUF'RS,
STAIR BUILDERS, ETC.

THE TAFT COMPANY,

20 CUSHMAN STREET, - - - HARTFORD, CONN.

ATLANTIC WHITE-LEAD & LINSEED-OIL CO.,

MANUFACTURERS OF

"ATLANTIC"
PURE
WHITE LEAD,
—AND—
Pure Linseed-Oil,
Raw Refined and Boiled.

The best and most reliable White-Lead made,
And unequaled for
Uniform Whiteness, Fineness, and Body.

Robert Colgate & Co.,

287 PEARL ST., NEW YORK.

ARCHITECTS
And others interested in
Oriental Architecture

Can find Photographs of the great Temples and Palaces of the East at the
PERSIAN AND EAST INDIA COMPANY,
28 West 23d Street, New York.
T. O. HAGUE.

DECORATIVE DESIGNS
of the first order are published monthly in
THE ART AMATEUR,

A Handsome Folio devoted to Home Art.

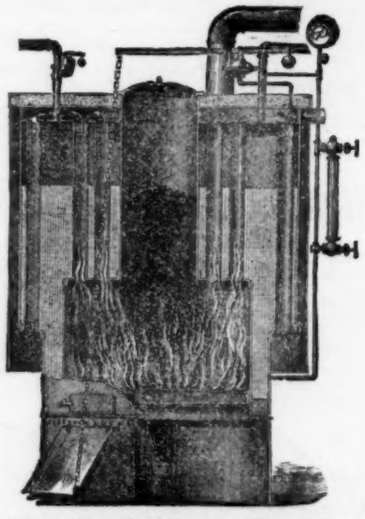
Besides its fully illustrated and critical reviews of passing art events and biographies of artists and decorators, and its valuable departments of "Furniture and Decoration," and "Answers to Correspondents," (full of suggestions), architects will find in the numerous supplement pages motives for all kinds of

INTERIOR DECORATION.

Terms, $4.00 a year. - Single copies, 35 cents
Specimen copy sent for 25 cents if this journal is named.

MONTAGUE MARKS,
23 Union Square, NEW YORK, N. Y.

GORTON'S
House-Heating
Steam Generator.



Self-Feeding, Base-Burning, Wrought-Iron.

First-class in its construction, perfectly safe in use-generates steam quickly and rapidly; is compact, taking small floor-space, requiring no brickwork in setting; economical in the use of fuel, and costing much less than any other wrought-iron boiler of like capacity now in use. Write to us for catalogue and price-list.

GORTON BOILER M'F'G CO.,
110 Centre Street, New York.

Something New for the Stable.
Read's Patent Harness Bracket.

An Article long wanted but never before made.

Holds the whole harness, takes no more room than the ordinary hook or peg, can be used for both single and double harness. Gives the harness-case a neat appearance, as it carries the harness up uniformly in width with the saddle, beside keeping the bridle and breastplate in their proper shape. They are neatly japanned, with gilt facings. Price $18 per dozen. Are now in use in over 100 first-class private stables in and about Boston.

Each bracket lettered "J. J. Read, Boston, Mass." For sale by dealers everywhere.

Indorsed and approved by the following named gentlemen, all of whom have them in use:

Boston; R. H. White, J. M. Sears, J. T. Morse, Jr., Thos. Motley. Cambridge: F. A. Kennedy. Portsmouth, N. H.: Hon. Frank Jones. Milton: H. P. Kidder, Col. H. S. Russell, J. M. Forbes. Dedham: A. W. Nickerson. Newton: J. C. Potter. Salem: Dr. W. Saunders. Waltham: J. H. Ellison. Readville: C. G. White. Beverly: Dr. Chas. Haddock. Swampscott; C. P. Curtis.

The public are cautioned against all similar brackets, not marked with my stamp, as such brackets are infringements of patents held by me.

Also cedar-top riding-saddle bracket. Price $3.50 each. An whip-rack for English coach and straight whip combined. Price 50 cents each.

JAMES J. READ, 13 Tremont Row, Room 10.